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24672.

TRANSACTIONS OF THE

SECTION ON

Cutaneous Medicine and Surgery

of the
American Medical Association
at the Fifty-seventh Annual
Session, held at Boston,
Mass., June 5 to 8, 1906

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GENERALIZED MULTIPLE PIGMENTED SARCOMA ORIGINATING IN THE SKIN.

WILLIAM FRICK, A.M., M.D.
AND
FRANK J. HALL, M.D.
KANSAS CITY, MO.

The subject of this paper is generally recognized as presenting a distinct clinical picture, differing from all other sarcomata. The metastases may invade all the soft tissues. The distribution of the metastases appears to be by way of the blood stream and the lymphatics. There is always pigmentation, sometimes much, at other times little. In the same case we may find one nodule black and another white. The pigment is unevenly distributed. Some of the metastatic tumors appear entirely without pigment, while others in the same case are deeply pigmented. This pigment is the dark-brown, granular material known as melanin and is the same material that we find in normal skin and in pigmented moles. The disease is one of the most fatal of malignant tumors, and after metastases take place the case is practically hopeless.

The cases of multiple pigmented growths which are recorded as recovering either spontaneously or by arsenical treatment are evidently not of this variety, but probably can be placed in another class, described by Boeck[1] as "multiple benign sarcoid of the skin." Boeck has still further studied this disease in more recent cases and concludes that it is allied to tuberculosis, and there-

1. Jour. of Cutaneous and Genitourinary Diseases, vol. xvii, p. 543.

fore suggests the name *benignes miliar lupoid*[2] as a suitable one.

The beginning of this very malignant disease is most frequently in a pigmented mole, but not always so, as one would be led to believe by Unna's statement.[3] Crocker[4] reports a case which began as a blister, apparently due to friction on the outer side of the right foot. In the course of five months it became a fungating mass, slightly pigmented. The primary tumor was excised and followed promptly by metastatic tumors distributed through the body generally, which proved fatal in four months from the removal of the first tumor. In his report of a series of cases, J. C. Johnson[5] says of Case 7: "A most careful search failed to reveal any nevus or other melanotic growth of the skin or mucous membrane. There was no scar resulting from the removal of such tumor." In the body of his paper he intimates that the origin of this case may have been in the cortical portion of the adrenal, and cites another case in which the origin was claimed to have been from the same structure. In one of the cases reported in this paper the first tumor observed was on the glans, at the edge of the meatus. In a few months this became a fungating mass, involving the entire glans penis, on account of which the penis was amputated.

Melanotic whitlow is also mentioned by Crocker and by Johnson. It was first described by Hutchinson and begins at the nail fold without the appearance of a nevus.

We must also recognize the fact that pigmented sarcomata originate in the eye, and if not early removed give rise to the same generalized metastatic tumors. There seems to be no attempt on the part of oculists to call these by any other name than sarcomata. Johnson,

2. Archiv, für Dermat. und Syph., vol. lxxiii, p. 332.
3. "Histopathology of Diseases of the Skin," p. 745 (Walker's Translation).
4. Crocker: "Diseases of the Skin," third edition, p. 102.
5. "Melanoma," Jour of Cutaneous Diseases, vol. xxiii, p. 59.

in his work on "Melanoma,"[6] gives statistics gathered by Eves, which indicate that of 261 cases of generalized melanotic tumors 84, or about 32 per cent., originated in the eye, while 177, or about 68 per cent., originated in the skin.

Before 1893 the disease was recognized as "multiple pigmented sarcoma." In that year Unna published his work on the origin of pigmented moles[3] or soft nevi. In this work he tries to show that these are derived from epithelium, and hence that tumors originating in them are carcinomata. To these he gives the name "nevo-carcinoma," a name which he considers expressive of the character and also of the origin of the disease. The work and the opinions this great investigator gives to the world always demand consideration. His opinion on this subject gave a new impetus to the original work and caused a difference of opinion among investigators. Some agree with Unna, while others do not. In this country Gilchrist,[7] Schalek[8] and Ravogli[9] are advocates of Unna's theory. The recent work of J. C. Johnson on "Melanoma" is intended to prove that the tumor cells of pigmented moles are derived from the endothelium of superficial lymphatics.

This investigator has gone thoroughly into the histology of "soft nævi" and also of malignant melanotic tumors and his opinion is certainly entitled to careful consideration. In this work, however, he also records other melanotic growths which he unhesitatingly pronounces carcinomatous. There are also other cases of undoubted melanotic carcinomata on record. Prof. Eduard Lang[10], February 17, 1905, reported to a Vienna medical organization, (*K. K. Gesellschaft der Aerzte in*

6. Jour. of Cutaneous Diseases, vol. xxiii, pp. 1-49.
7. Jour. of Cutaneous and Genitourinary Diseases, vol. xvii, p. 117.
8. Jour. of Cutaneous and Genitourinary Diseases, vol. xvii, p. 145.
9. Jour. of Cutaneous and Genitourinary Diseases, vol. xx, p. 510.
10. Wiener klin. Wochft., Feb. 23, 1905.

Wien) a case of very extensive growths in a man 52 years old. The duration of the disease was 23 years and very many pigmented lesions were present, which proved on histological examination, to be carcinomatous.

In 1904, Dr. W. W. Keen read before the surgical section of this Association a paper entitled: "The Danger of Allowing Warts and Moles to Remain Lest They Become Malignant."[11] This paper is of great clinical interest. It gives the clinical histories of 25 cases of malignant tumors originating in these apparently innocent growths. Some of these were sarcomata while others were carcinomata. From case histories the carcinomatous melanotic tumors appear much less rapid in their fatal effect.

Prognosis in these cases is of the very worst. Treatment seems to accomplish nothing. Arsenic and other tonics are of no avail. Coley's toxins do no good, and even the wonderful *x*-ray seems of no value whatever. The only thing that offers any encouragement is complete excision of the primary tumor. Even this fails many times, either because the operation is not radical enough, or because the tumor cells have already been carried some distance from the original site of the disease. In the first case of this series, the original growth was apparently completely excised and yet it was only a few months before metastatic tumors made their appearance. In a number of Dr. Keen's cases the original tumor was completely excised, but the operation was followed in a short time with generalized distribution and death. Yet if these tumors are excised, with a wide margin, quite early in their development, a few days after growth can be observed, we believe a fatal termination can often be avoided. The patient in the first of the following reported cases was observed rather closely by me during the last three months of his life. The development and multiplication of tumors were rapid.

11. THE JOURNAL A. M. A., vol. xliii, p. 96.

CASE 1.—Male, aged 65. He has been married 42 years and has raised a family of four children, all of whom are living and well. His wife is also living and moderately healthy.

Family History.—His father died with pulmonary hemorrhage (tuberculosis) at 55. His mother died at 35 with some acute puerperal disease shortly after the birth of a child. One sister is living and healthy at the age of 68. One brother died in infancy; one with acute paralysis when 63 years old; one was a "hard drinker" and died at 66 directly following a spree, from some cause not known; and the last brother died at 65 with "nervous prostration." This last brother had a hard lump on one hand in the last years of his life.

Personal History.—The patient states that eczema was a family inheritance, and that most members of the family suffered more or less with this disease in youth. The patient had "scald head" from babyhood until about 20 years old. Aside from this he was a healthy man all his life until about July, 1903. His occupation was farming until 1897, first in Minnesota, then in Nebraska and Oklahoma. He served one year in the Army, under Thomas in the Civil War. In 1897 he moved to Salt Lake City and engaged in mission work—keeping rooms and providing food for the poverty-stricken class of people there.

For many years (he does not know how long) he had a mole of a brown color on his back between the shoulders. He first noticed this begin to grow in July, 1903. About a month previous to this he had a pleurisy on the right side. The mole seemed to become inflamed and painful and continued to grow. He sought medical advice and was advised to have the tumor excised, which he did perhaps two months after first observing the increase in size. A few months later he observed a growth in the right axilla and another on the right side of the neck. These were entirely subcutaneous.

Examination.—I first examined this patient in July, 1904. He came to see me because his general health seemed to be below par, and because instead of one tumor on his back a group of six or eight had made their appearance. The one in the axilla was becoming uncomfortable on account of its size. It was at that time about the size of a hen's egg and quite hard. Those grouped on the back varied in size from a pea to an ordinary marble; some were almost entirely subcutaneous while others quite decidedly involved the skin. Some were bluish in color while others seemed simply red, no pigment apparent through the skin. One of the most prominent of the skin tumors was excised for histologic examination. It was

quite firm to the touch, and alveolar in structure, with a moderate amount of pigmentation.

Subsequent History.—After this he went to the sanitarium at Battle Creek, Mich., where another nodule was excised, and he was advised to return home since chances for successful treatment were practically nil. Arsenical treatment was given a trial without benefit, also tonics such as quinin, iron and strychnin. No improvement followed, but more nodules continued to appear, and they were seen to appear farther from the site of the original tumor. As a last resort hypodermic injections of Coley's toxins were administered. Six injections were given from August 7 to September 2 without any improvement whatever, but instead, new nodules continued to appear almost daily. Since the injections rendered him quite uncomfortable for two or three days, a rise of temperature following each one, we listened to his objections and desisted from its farther use. By this time the nodules were scattered all over the body, back, abdomen, legs, arms and even the backs of the hands. Patient said he felt as though there were some growing in his stomach. As the disease advanced it seemed to progress more rapidly. About the first of October the man was no longer able to retain food, vomiting was frequent, and food taken in the stomach seemed to distress him, so he quit taking any for a week or more. Still the nausea and vomiting were present. A little later his right leg became cold and numb —due to pressure of a large tumor as ascertained at autopsy. October 26, at 10 p. m., he died, and at 9 a. m. October 27, an autopsy was held.

Autopsy Report.—Man, 6 feet 2 inches in length, emaciated. Tumors distributed over the surface of the body generally. Small on abdominal surface and purple blue. Over back, larger and black in color, elevated mushroom-like. Subcutaneous fat practically nil. Abdominal cavity contains small quantity of gas. Pericardium full of fluid. Whitish-red tumor nodules on the surface of pleura and liver, in mesentery and in the epiploica of colon. They vary in color from pinkish white to dark liver color. Small amount of serous fluid in abdominal cavity. Dilated gall bladder filled with bile and reaching to crest of ileum. Thoracic duct full of nodules. Large white nodule situated at the bifurcation of the iliac artery. The stomach presents a large dilatation at the cardiac end and appears diminished in size at the pyloric end. Stomach is slightly adherent at spleen. Large masses of tumors cover a diphragmatic hernia at the cardiac end of the stomach. Half pint of bile-stained fluid in stomach. No nodules in the stomach. Pancreas contains tumor nodules throughout its length. Large

tumor masses at head of pancreas occlude common duct, causing dilatation of gall bladder. Left adrenal gland much enlarged and full of tumor nodules. Left kidney normal in size and contains a few subcapsular tumors and many in the perinephritic tissue. Large quantities of clear fluid in left pleural cavity. Left lung small and flabby. Peribronchial portion contains tumor masses. The upper portion of lower lobe is emphysematous. Section into this region reveals a quantity of greenish-yellow pus. Right lung normal in upper portion, but presents consolidation in lower half and over the surface is scattered a small number of white nodules. The consolidated portion when cut discharges quantities of bloody fluid. No deep-seated nodules discovered. Pericardium full of nodules greatly thickened and distended by straw-colored fluid. The heart presents innumerable tumor elevations over its entire surface, destroying the landmarks of the organ. Nodules are all firm and vary in color from white to a deeply pigmented—almost black. Liver is normal in size, of a dark brownish color, mottled with lighter areas and presents on its surface several nodules.

The most striking thing in this case is the great tumor development on and through the heart, and next to this the number developed in the thoracic duct.

We are indebted to Dr. Geo. M. Gray of Kansas City, Kans., for the history of this case.

CASE 2.—Male, aged 33, was admitted to St. Margaret's Hospital, Nov. 17, 1904. Nationality Irish, single, occupation, stone-cutter. Residence, Kansas City, Mo.

Previous History.—He had what was supposed to be a chancre 18 months ago, and after treatment for a period of six months the penis was amputated. (The surgeon who amputated the penis writes that the growth was cauliflower-like and involved the entire glans. He saw the case first Dec. 11, 1903, and performed amputation Dec. 22, 1903. He supposed it a case of syphilis and gave antisyphilitic treatment. The enlarged glands in the groin diminished in size after the amputation. The patient disappeared from his observation about three weeks after operation.) At the time the penis was amputated the inguinal glands were enlarged and one in either groin above Poupart's ligament was as large as the end of the index finger. These continued to grow after the penis had healed, and one on the right side broke down, discharging a very offensive fluid, and on account of this condition he applied to St. Margaret's Hospital.

Family History.—His father is dead; his mother is living and

in good health. One brother and three sisters are living and in good health.

Present Illness.—The trouble began 18 months ago with a sore on the penis near the meatus, which persisted in spite of all treatment for six months, when the penis was amputated. This sore made its appearance about three weeks after venereal exposure and was supposed to be venereal. Before the penis was amputated the glands in both groins began to enlarge, but following the amputation he thinks they diminished somewhat except the larger ones. During the past 11 months they have been steadily enlarging until two weeks ago, when the mass on the right side broke down, discharging a bloody fluid of very bad odor.

Examination.—This revealed a large mass on each side of median line well above Poupart's ligament. One on right side was ulcerated. These masses were excised Nov. 21, 1904. At the time of operation I could make out nodular masses extending down into the pelvis on either side supposed to be glands.

Postoperative History.—He left the hospital Jan. 26, 1905. Before he left it was observed that something was not right mentally; and he left the hospital without permission or advice from the doctor. After this date we lost track of him for 18 days, but we can readily understand that during these days there was continued development of tumors with more evidences of brain disturbance. On February 13 the ambulance of the Kansas City General Hospital was sent to move him from a rooming house to the hospital. It seems the driver or those in charge of the ambulance did not fully appreciate the man's condition and he was permitted to fall down a flight of stairs. He was picked up in an unconscious condition and taken to the hospital, where he died the next day without regaining consciousness. The autopsy was made about 24 hours after death. The development of the sarcomatous tumors in the brain was considered sufficient to account for the mental disturbances noticed in the last few weeks of his life and for the unconscious condition 24 hours before death.

Autopsy Report.—Male, aged 33, length 5 feet 7 inches, weight 140 pounds.

External Appearance: The whole anterior surface of the body is covered with dark, smooth nodules varying in size from a wheat grain to a walnut and having a pale blue color through the skin. The glans penis has been amputated and there are operative scars in both inguinal spaces.

Brain: On removing skull the brain is found to contain several deeply pigmented nodules about an inch in diameter that adhere to the dura.

Abdomen: On opening the abdomen the intestines are found to be collapsed and the great omentum crumpled up under the stomach. Abdominal cavity free from fluid. Mesentery of small intestine full of blood. Duodenum bound down by adhesions.

Stomach lies well to the left of body and contains fluid; surface is smooth. From cut surface tarry blood exudes.

Fig. 1.—Low power drawing from a small, cutaneous nodule from Case 1.

Liver is somewhat large, right lobe dark prune color. Right adrenal taken away with liver. Liver contains no nodules, but cut surface is a dark mahogany brown and blood exudes from it. Gall bladder is normal—free from stones.

Spleen normal in size, olive-shaped, anterior portion con-

tains chestnut-sized nodule which is soft in consistency and contains cystic center.

Pancreas normal in size and position. Splenic end enveloped in adhesions containing tumor nodules.

Sigmoid flexure shows large lymphatics.

Left kidney possesses no perinephritic fat and lies in normal position. Adrenal attached to kidney. Kidney surrounded by a mass of tumors which lie external to the gland. Section of

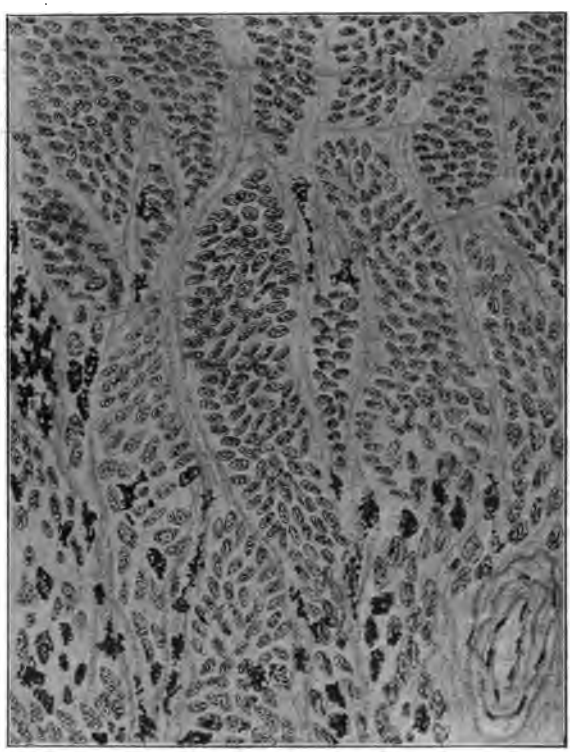

Fig. 2.—High power drawing from the same, showing alveolar structure, distribution of pigment and type of cell.

organ shows reddish-brown surface, uniform in color except at tips of pyramids, which are whitish. No nodules in kidney. Right kidney surrounded with a quantity of clotted blood. Organ similar to left except that there is a large nodule within the pelvis. Retroperitoneum full of nodules along the line of great vessels especially. Some tumor masses in the anterior peritoneum.

Thoracic Cavity: Lungs collapsed, left free and right adherent in upper portion where the apex is tightly fixed and contains many calcareous deposits. Lungs present hypostatic condition in posterior part. Anterior portions crepitate throughout. Nodules of various sizes all through the lungs. Pericardium covered with nodules up to the size of a pea. Pericardium contains small quantity of fluid. Two dark corn-grain sized nodules situated at base of heart near pulmonary artery. Small quantity of thin blood in right heart. Left heart contains tarry blood. Valves of the heart normal and muscles also normal.

Within the urethra near where the glans was amputated is a small, black, pea-sized tumor. It is situated in the mucosa and tends to obstruct the lumen of the urethra. The tunica vaginalis of the right testicle contains fluid. A few pea-sized tumors are found beneath the tunica. Within the testicle substance one small nodule. Left testicle contains no palpable tumor.

The point of greatest interest in this autopsy was the discovery of the tumor in the urethra. It was very dark, in fact the blackest one found and involved only the mucous membrane. We were led to speculate on the possibility of this being the real primary tumor in this case. I have not been able to find, in the literature, another case of the original tumor developing on or in the penis. Cases of sarcoma of the penis have been reported, but not of this variety, so far as I have been able to ascertain.

Case 3.—This case was in the practice of Dr. George W. Davis. Dr. Reyling made the histologic examinations and sent specimens to various other pathologists. It has been reported as Case 3 in Dr. Johnson's[12] series of cases. The photographs are of this case and show the distribution of the tumors over trunk, arms and face. Tumors were also on the other parts of the body. The photographs were taken and kindly furnished me by Dr. J. W. Perkins, who saw the case in consultation. The history of this case was difficult to obtain, but the origin was supposed to be in a pigmented mole. The tumors were extraordinarily numerous and very dark. Dr. Johnson says, in his report, that the very dark color was due partially to minute hemorrhages into the tissue.

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12. Jour. of Cutaneous Diseases, February, 1906.

We wish to place case 4 on record as it is one of the infrequently observed cases of melanoma occurring in the black race.

Patient.—This was a colored woman who came to the Kansas City General Hospital about two years ago because of a decline in health and the general development of tumors all over her body. She was about 30 years of age and of good muscular development. No family history was obtained by me.

Examination.—Her skin was a dark brown, but the tumors were much darker than the other skin. They varied in size from a pinhead to a good-sized marble, and some of them stood out very prominently, in shape resembling very much an ordinary, smooth doorknob. Many of these tumors left no doubt of the involvement of the skin in the growth, while others seemed to be subcutaneous. The origin was said to be in a mole. In the week that this patient was at the hospital many new tumors were observed springing up. The case was certainly one of this character.

Dr. T. C. Gilchrist[13] reports a case in a negro man, with microscopic report of tumors, and remarks that he could find but two other cases recorded in colored people. We intended securing a nodule for histologic examination and also a photograph of the patient, but she escaped from the hospital before either could be done, and was not heard from afterwards.

DISCUSSION.

DR. DAVID LIEBERTHAL, Chicago, said that he thought the title of the paper presented by Dr. Hall was misleading. Instead of multiple pigmented sarcoma, it should have been melanosarcoma. The name multiple pigmented sarcoma should be limited to the type first described by Kaposi in 1879, of which there are over a hundred cases recorded. This type differs from melanosarcoma in its clinical aspects and course. It usually first develops on the dorsal surface of the hands and feet, and gradually spreads upward, at last invading the internal organs, such as the liver and intestines, especially the large intestine, terminating fatally in six, seven or even twenty years. It never develops from warts, but has its origin in apparently normal skin. In its histologic appearance it differs markedly from melanosarcoma in the arrangement of the cellular elements. The pigment in melanosarcoma is mostly melanin, while in the multiple pigmented form hemosiderin is

13. Jour. of Cutaneous and Genitourinary Diseases, vol. xvii, p. 118.

prevalent. Both of these forms of sarcoma, Dr. Lieberthal said, are ultimately fatal. With melanosarcoma the course is usually a brief one. As regarded treatment, nothing seemed to have any influence but the *x*-ray, which, according to latest reports, benefits materially the lesions of the multiple pigmented type.

DR. A. RAVOGLI, Cincinnati, said that he agreed entirely with Dr. Lieberthal regarding the distinction between multiple pigmented sarcoma and melanosarcoma. He recalled a case of the latter affection which proved fatal in the course of four or five months. It first appeared as a small, warty growth on the foot, and was followed in a short time by an enormous enlargement of the glands in the groin, and the case rapidly progressed to a fatal issue. Dr. Ravogli also mentioned a case of multiple pigmented sarcoma of the Kaposi type, consisting of smooth, brownish spots on the leg, and which ran a course extending over a period of five years. These cases, he said, must also be differentiated from melanosarcoma, of which affection he saw an instance in a woman who presented herself with an apparently simple lesion which was regarded as a nevus. Starting from this lesion, the disease rapidly spread over the chest, the breasts also becoming involved, and the patient died in the course of four or five years, in spite of the use of the *x*-ray. Large doses of arsenic were also given without avail. It is important to differentiate between these three affections, he said, especially on account of the different prognosis that is attached to each.

DR. ALEXANDER J. ANDERSON, Newport, R. I., reported a case that came under his observation about 18 months ago. The patient was a woman who had had some glands removed from the left groin about five years before, which were supposed to be carcinomatous. When Dr. Anderson first saw her, about 18 months ago, she had a pigmented lesion about the vulva, which was removed by a surgeon. It had the appearance of a melanotic growth, but the pathologist pronounced it a lymphoma. A year later, when Dr. Anderson again saw the woman, the pigmentation at the site of the previous lesion was well marked and she had a new growth, about the size of a duck's egg, in the right groin, which proved to be a melanosarcoma. The patient recovered from that operation, but before she could receive further treatment, metastatic growths developed in the breast and elsewhere, which proved fatal in the course of a few months.

DR. B. W. STEARNS, Binghamton, N. Y., stated that he had given the subject considerable attention for the past six years, and he is inclined to believe that too much emphasis is laid on the classification of malignant growth and too little on the treatment. He also referred to the fact that the course and development of these growths seems to be influenced by the constitution of the patient. Their locality and other factors

should be borne in mind in diagnosis. Thus far the only treatment accepted by the profession generally is the early removal either by the knife or by caustic pastes. If all the physicians of a city or certain locality would place all cases of malignant growths under the care of one physician who is interested in the subject, perhaps in the future some more successful line of treatment might be developed. He referred to a case of epithelioma of the temple which was excised. At the same time there was some enlargement of a section of the parotid gland, which was not interfered with, the reason given by the surgeon being that it would have destroyed the duct. After three years the growth returned at the site of the original lesion and gradually extended over the face. A fatal issue is expected, and all that can be done for the patient now is to keep her comfortable by the application of a dressing which relieves the pain and removes the offensive odor. The dressing in this case is:

℞.	Thiosinamin .....gr. xx	1	3
	Atropini .....gr. i		06
	Adrenalin, chl. solut.		
	Ergotini		
	Fld. ext. thuja, āā.....ʒss	2	
	Cocainæ hydrochlor.....gr. x		6
	Alcoholis dil. q. s.....ʒi	30	

This was applied with absorbent cotton and gauze daily.

Dr. Hall said that he is not in a position to discuss the subject in a clinical way, as his work is limited to pathology. He agreed essentially with the statements made by Dr. Liebertha1.

THERAPEUTIC VALUE OF CHRYSOPHANIC ACID IN DERMATOLOGY.

CHARLES JAMES FOX, M.D.
HARTFORD, CONN.

I desire to present in this paper some clinical observations and suggestions as to the value of chrysophanic acid as an effectual therapeutic remedy locally in certain superficial parasitic skin diseases.

Chrysophanic acid is obtained from "Goa powder" which is found in the heart wood or cavities formed by decay in the wood of *"Andira Araroba,"* a tree found in Brazil. It is also found in Rhein, U. S. P., and is produced by the oxidation of Chrysarobinum, U. S. P., a constituent of Goa powder. Lieberman proved that in the latter the acid was very largely present and easily transformed by oxidation. It is a pale orange yellow microcrystallin powder, odorless and tasteless and which, on exposure, to air, turns a brownish yellow color. The remedy has long been used in Brazil, and has spread through Portuguese commerce to India and the East, while its general European and American employment is comparatively recent in certain varieties of skin disease.

It was first noticed in 1876, in London, England, in Fox's "Skin Diseases of India," and then since then it has at times been favorably endorsed as a dermatological remedy.

In some 65 cases of psoriasis it exerts a specific power and is therapeutically of great value. The following case reports illustrate its potency:

CASE 1.—Mr. A., aged 28, an active business man, a native of Connecticut, consulted me Jan. 28, 1906.

Family History.—Negative, except that two cousins had had erysipelas.

Personal History.—He had had no illness since childhood, except some infantile disease, but four years ago he noticed a series of patches over the extensor surface of both limbs, the tips of both elbows and both knees, and a few weeks later patches were found on the scalp and trunk. These were dry, red, primarily rounded in character, and covered with imbricated silvery adherent scales, much more copious on the scalp and forehead, but to a lesser extent on the extremities. He gave a history of treatment internally, but with little results, from arsenic, mercury and other special remedies.

Physical Examination.—Height, 5 feet, 10¾ inches; weight, 119 lbs.; temperature was 98.5; pulse, 74; respiration, 17. Lungs, liver, heart, spleen and kidneys were normal.

Treatment.—Believing that local remedies would be more effectual by removing and preventing the renewal of the scales, on January 28, I placed him on internally Pil. phosphori 1/30 grain, three times a day, and locally Unguentum chrysarobini, U. S. P., applied twice a day (10 per cent.) continued with semi-weekly observations until March 1, when pain in the epigastrium with copious diarrhea became constant, showing the maximum effect of the phosphorus, and this was discontinued. Then an ointment containing 20 grains of chyrsarobin to the ounce of benzoated lard, was ordered.

Course of the Disease.—On March 8 there was some improvement. Treatment was continued. March 15: There was marked improvement, only traces of the eruption were found on the abdomen and lower extremities. Treatment was continued. March 22: He had now steadily used the ointment since March 1. There were no traces of the eruption found in any portion of the body except faint stains on the right knee. March 29: There were no traces whatever of the eruption and he had no further trouble. The dark, yellow stains had disappeared, following the application locally of weak solutions of chlorinated lime, morning and night.

My conclusions were that after a certain time the antagonism of phosphorus of psoriasis finds its equilibrium, and that the antagonism in question, although real, nevertheless had a limit which falls short of a complete cure, but that the specific value of the acid in

psoriasis seems to be now unquestioned. The following will illustrate its value in 114 cases of *eczema:*

CASE 2.—Mr. B., aged 18, a native of France, consulted me Nov. 28, 1905.

Family History.—Negative, except that two sisters had the same eczema.

Personal History.—The patient has always been well since childhood, but has suffered from eczema for the past nine years with no benefit from any plan of treatment.

Physicial Examination.—Lungs, liver, heart, spleen and kidneys were normal; height 5 ft. 8¾ inches; weight, 117 lbs.; pulse was 69; temperature, 98.5; respiration, 17. Eruptions were present on the scalp, face, trunk and lower limbs.

Treatment.—The patient was placed on proper diet and the bowels were kept freely open with tonics, which constituted the only internal remedy. Unguentum chrysarobini, xx grains to the ounce of benzoated lard, was ordered applied locally twice a day.

Course of Disease.—On December 1 there was some improvement, but I ordered the ointment applied morning, noon and night. December 15: The eruption had almost disappeared; treatment was continued. December 20: The patient presented himself with all eruption absent.

It is remarkable that what seems to be no more than a common irritant should possess so peculiar specific a value. Some who are opposed to its use say that it produces an eczema, and indeed it does, but in this very fact resides its virtue. I have used it in children with excellent results.

In Herpes circinatus it is also of value. The remedy was effectual in some 35 cases.

CASE 3.—Mr. C., aged 28, came to my office Nov. 30, 1905.

Family History.—Negative.

Personal History.—He had had no illness except pneumonia, eight years ago, from which he fully recovered.

Physical Examination.—Lungs, liver, heart, spleen and kidneys were normal. He is well-nourished; height, 5 ft., 11 inches; weight, 119 lbs.; temperature was 98.5; pulse, 71; respiration, 18. The eruption was extensive. There was a cluster of vesicles near the spine of the neck extending over the scapula. then to the shoulder and axilla, whence the main line ran along the outer side of the arm until it reached the elbow when it turned inward, followed the inner side of the forearm and

went across the palm of the hand, terminating by several patches on the palmar and inner side of the ring finger.

Treatment.—The chrysarobin ointment was applied (20 grains to the ounce) morning, noon and night, with the necessary tonics and laxatives in the form of aperient waters.

Course of the Disease.—On December 5 the eruption had almost disappeared. Treatment was continued. December 15: The patient had no eruption and was apparently cured. December 22: The patient called and reported no return of the affection.

In sycosis I regard chrysophanic acid highly, as seen in the report of the following (one of eleven cases):

CASE 4.—Mr. D., aged 23, a native of Massachusetts, consulted me Nov. 20, 1905.

Family History.—This was excellent, except that one cousin on his mother's side had erysipelas.

Personal History.—He had pneumonia when 10 years old with full recovery; he had no other illness until the present, which was contracted some three months ago while away on a southern trip. Prompt treatment ever since had failed to give any except temporary relief.

Examination.—Papules and pustules were present involving the beard, whiskers and moustache, also to some extent the vertex, accompanied by inflammation and suppuration especially. When the hairs were extracted th , seemed to be covered with a whitish powder. The patient was very nervous and had suffered from insomnia for nearly two weeks. Lungs, liver, heart, spleen and kidneys were found normal. Pulse was 68; temperature, 98.5; respiration, 17. There was general emaciation; he was about 22 lbs. lighter than when first taken ill.

Treatment.—Epilation was ordered and 20 grains of chrysarobin to the ounce of benzoated lard twice a day with needed tonics.

Course of Disease.—On November 30 there was some improvement along the sides of the face. I ordered the ointment applied morning, noon and night, and continued epilation regularly. December 3: There was marked improvement. December 7: The patient had fully recovered. December 15: There was no return of the disease and all the affected parts had become normal.

After epilation, the application of the acid seemed to enter the pustules and to strike at the root of the disease, the contents of the pustules being converted into a white substance, doubtless effectually destroying the offending

parasite. This opens a new field for favorable observation.

DERMATITIS VENENATA.

Externally the application is liable to produce a peculiar deep, almost copper-red erythema, but after a few days the skin returns to its normal appearance. This shows the detergent properties of the acid, and all stains are soon removed by using a weak chlorinated lime solution. When the application of the drug is discontinued the bright red hue gradually changes to an Indian red; then in a few days desquamation occurs, and very soon the normal white skin is the result. The best way to apply the ointment is to rub it thoroughly into the scaly patches with a swab or tooth-brush. As it stains the nails badly, I prefer, sometimes in order to confine the ointment to the diseased tract, to rub it into a soft paste with water and to rub it over the patches, especially in psoriasis from which the scales have been removed. When this is dried, a layer of thin collodion should be applied over each patch and allowed to harden as a protective coating. Subsequently the patches are removed and the white skin appears. My favorite formula is: ℞ Chrysarobini, 10 parts; acidi salicylici, 10 parts; etheris, 15 parts; collodii flexilis add 100 parts.

Paint over the patches every day until they disappear and smooth skin appears. This preparation should be used with great caution, however, and when the skin is irritable and the congested patches are increasing in numbers it is then contraindicated, like arsenic internally. When the eruption is disappearing, or when chronic-thickened patches remain unchanged for a long time, an ointment of varying strength will effectually and speedily remove the scales and lessen the infiltration. I am not in favor of using the remedy on the scalp or face ordinarily, because it discolors the hair and conjunctivitis may follow.

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DISCUSSION.

DR. HENRY G. PIFFARD, New York City, gave a brief review of the early history of chrysarobin, which is made from the goa powder, and comes from Bahia, a Brazilian port. The speaker said that there is a vast difference in the various preparations of the drug that are on the market; some are slightly inert, some have very little effect, and some are very active.

DR. WILLIAM S. GOTTHEIL, New York City, said that in using chrysarobin he did not expect to get the proper effect from the drug unless the preparation was sufficiently strong to produce a decided reaction of the skin. He frequently used a 30, 40, or 50 per cent. ointment, which in that strength made a semi-solid mass, his object being to produce an inflammatory reaction in the skin. Most of the poor results from the use of the drug could be attributed to the weak or inert preparations that were applied.

DR. JAMES C. WHITE, Boston, said that he did not agree with Dr. Gottheil that it was necessary to produce a dermatitis in order to get the beneficial effects of chrysarobin. Personally, he preferred to use it strong enough to get its curative effects only, without producing a dermatitis. The latter was largely a matter of individual idiosyncrasy; in some persons a dermatitis would develop from its use, while in others such a result would never follow. The same is true of certain other drugs.

DR. R. A. MCDONNELL, New Haven, Conn., in referring to the objection to the use of chrysarobin on the scalp for fear of causing a conjunctivitis, said that he had applied it in many cases of fungous disease of the scalp with very satisfactory results, and without producing a conjunctivitis. He regards it as one of the most reliable remedies, particularly in parasitic diseases of the scalp.

DR. EDMUND L. COCKS, New York City, said that about a year ago he treated ten cases of parasitic disease of the scalp with chrysarobin with undoubted success, and without any resulting conjunctivitis or dermatitis. The scalp was first shaved, and then a solution of chrysarobin, one dram to two ounces of collodion, was painted on every second or third day, and reapplied as often as the application cracked.

DR. HENRY C. BAUM, Syracuse, N. Y., said that he thought the chrysarobin should only be used on the scalp in exceptional cases. Kaposi himself had warned his pupils regarding the possible dangers of applying the drug in that locality. Dr. Baum said that he had seen a number of cases of violent dermatitis follow the use of chrysarobin on the scalp. He recalled one instance where a physician had applied a small amount of chrysarobin to a ringworm of the nose in a young woman. It produced a violent dermatitis which extended to the eyes,

and culminated in complete blindness. In every instance in which the drug was applied to the face or scalp, the case should be watched with the greatest care, and only a small area treated at a time until the individual idiosyncrasy of the patient could be determined.

DR. L. WEISS, New York, said that in using chrysarobin on the face or scalp, the possible resulting dermatitis could be prevented from spreading by the application of zinc gelatin, which acts as a compress.

THE CURE OF PSORIASIS, WITH A STUDY OF 500 CASES OF THE DISEASE, OBSERVED IN PRIVATE PRACTICE.

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Psoriasis is well known to be one of the most obstinate of all diseases of the skin, discouraging alike the physician and patient, and one which often persists for many years, or recurs, in spite of various attempts at cure, While, under proper and energetic local treatment, it is often possible to remove the existing lesions in a shorter or longer time, the tendency to a recurrence of the eruption is so strong that some have regarded the disease as incurable, and too often have only attempted to give relief to the cutaneous symptoms present, principally by local means.

It is to be noticed that writers who base their judgment on cases seen in public practice, and who dwell principally on the local treatment of psoriasis, speak most discouragingly in regard to the possibility of its permanent cure, while certain others, who study the disease in its broadest aspects, express the most hopes of ultimate recovery.

In order to understand the disease better I have looked over my records of cases of psoriasis seen in private practice during the last 35 years, and have had them analyzed in several particulars, which will be presented later. The total number amounts to 509 separate cases seen among 14,120 patients with miscellaneous diseases

of the skin. This makes the percentage of psoriasis to be 3.6, which is somewhat smaller than that I reported some years ago.[1] The difference is probably due to the exclusion of cases of dermatitis seborrhœica (which may often resemble psoriasis) both of late years, and from older records of cases in which the history seemed to point to this affection; so that the cases here analyzed are all undoubtedly of the disease under consideration.

TABLE 1.

AGE AT TIME OF CONSULTATION.

Age.	Private Practice.			Public Practice.			Grand Total.
	Male.	Female.	Total.	Male.	Female.	Total.	
Under 5 years.....	..	2	2	5	6	11	13
From 5 to 10.....	3	11	14	24	62	87	101
From 10 to 15.....	6	9	15	46	79	125	140
From 15 to 20.....	25	42	67	65	114	179	246
From 20 to 25.....	34	44	78	114	135	249	327
From 25 to 30.....	48	41	89	146	129	275	364
From 30 to 35.....	53	23	76	136	88	224	300
From 35 to 40.....	46	12	58	87	40	127	185
From 40 to 45.....	27	5	32	66	42	108	140
From 45 to 50.....	23	6	29	41	40	81	101
From 50 to 55.....	13	6	19	29	20	49	68
From 55 to 60.....	6	5	11	22	11	33	44
From 60 to 65.....	4	6	10	16	11	27	37
From 65 to 70.....	3	2	3	5	8	7	12
From 70 to 75.....	2	..	2	5	2	7	9
From 75 to 80 (78).	1	..	1	2	..	2	3
Unknown age	1	..	1	..	6	6	7
	295	214	509	806	791	1,597	2,106

This proportion is a trifle larger than that observed in public practice. Thus, of 48,132 cases of miscellaneous skin diseases treated at the New York Skin and Cancer Hospital during the last twenty-two years there were 1,597 of psoriasis, making a percentage of 3.3; this varied in different years from 2.2 to 4 per cent. In private practice the males outnumbered the females, there being 295 males, or almost 58 per cent., to 214 females, or 42 per cent. In public practice the females were slightly in excess, 806 males and 791 females.

1. "Clinical Study and Analysis of 1,000 Cases of Psoriasis," Trans. First Internat. Dermatol. Cong., Paris, 1890, p. 879.

In looking at Table 1 we see that psoriasis comes for treatment at all ages; there were two patients under 5 years of age, the youngest being a female child of 2 years; the oldest patient was a male aged 78 when applying for treatment. But by far the largest number were first seen between the ages of 15 and 35, 310 in all, over 60 per cent., and the most in any quinquennium were in the period between 25 and 30, 89 patients.

TABLE 2.

AGE AT FIRST APPEARANCE OF PSORIASIS.

	Male.	Female.	Total.
4 months	1	..	..
Under 1 year	3	..	3
From 1 to 2 years	2	3	5
From 2 to 3 years	2	6	8
From 3 to 4 years	1	3	4
From 4 to 5 years	3	7	10
From 5 to 10 years	21	31	52
From 10 to 15 years	25	50	75
From 15 to 20 years	57	38	95
From 20 to 25 years	57	38	95
From 25 to 30 years	30	15	45
From 30 to 35 years	28	7	35
From 35 to 40 years	22	6	28
From 40 to 45 years	10	4	14
From 45 to 50 years	7	8	15
From 50 to 55 years	5	3	8
At 56 years	..	1	1
At 59 years	..	1	1
At 61 years	..	1	1
At 63 years	..	1	1
At 64 years	..	1	1
Unknown	10	2	12
	283	226	509

Of more interest, however, is Table 2, which shows the age at which the eruption was first developed. Here it is seen that the skin lesions may begin at a very early age, the youngest recorded at 4 months, and in all 30, in whom it appeared before the age of 5 years, almost 6 per cent. of the whole; there were 52 cases, or 10 per cent., in which the eruption was first noticed between the ages of 5 and 10 years, a total of 82 cases, or 16 per cent., before the age of 10 years; this, however, differs from the statement of Neumann[2] that the eruption gen-

2. "Lehrb. der Hautkr.," Wien, 1873, p. 259.

erally appears about the sixth year of life. It will be noticed that the eruption was recorded as appearing most frequently between the ages of 15 and 25, 190 cases, or 95 in each quinquennium; curiously enough, also, the numbers of males and females were exactly alike in each period of five years. It will be also noticed how very seldom it first developed after the age of 55, only 5 cases.

TABLE 3.

DURATION BEFORE TREATMENT.

	Male.	Female.	Total.
Under 1 year.....	42	38	80
From 1 to 5 years.....	68	50	118
From 5 to 10 years.....	60	63	123
From 10 to 15 years.....	45	30	75
From 15 to 20 years.....	30	20	50
From 20 to 25 years.....	22	8	30
From 25 to 30 years.....	9	..	9
From 30 to 35 years.....	5	..	5
From 35 to 40 years.....	3	1	4
From 40 to 50 years.....	2	1	3
Unknown	10	2	12
	296	213	509

That psoriasis is a chronic and rebellious disease is seen in Table 3, which exhibits the duration of the eruption before coming for treatment. While there were a few cases in which the patient was seen some weeks or months after it had first appeared, it will be observed that in a very large number of instances, 118, the eruption had already existed between one and five years, and in a still larger number, 123, it had first developed between five and ten years before the record was made. The diminishing numbers after this period do not by any means indicate that the eruption may not last even longer than the highest period mentioned, fifty years; for we know that it frequently does continue till death. It only shows that after the eruption has lasted many years, perhaps with intermission, the patient no longer attempts to get relief, hence the small number seen after a duration of twenty to twenty-five years.

PROLONGED TREATMENT NECESSARY.

Patients with psoriasis are proverbially restless under treatment, and continually wander from one physician to another, visit mineral springs, and try about all the quack remedies. It is very hard to hold them to a strict régime of diet and hygiene, and internal medication for a length of time, and they even tire of the local treatment when it is not rapidly beneficial. With a return of the eruption they naturally seek other help.

TABLE 4.

DURATION OF OBSERVATION OF CASES.

	Male.	Female.	Total.
Seen once	75	33	108
1 month or less	43	25	68
1 to 2 months	16	17	33
2 to 4 months	12	20	32
4 to 6 months	16	14	30
6 months to 1 year	36	32	68
1 to 2 years	21	20	41
2 to 3 years	16	14	30
3 to 4 years	6	5	11
4 to 5 years	9	1	10
5 to 10 years	18	20	38
10 to 15 years	9	14	23
15 to 20 years	4	5	9
20 to 25 years	3	2	5
25 to 30 years	2	1	3
	286	223	509

In Table 4 is exhibited the duration of observation and often irregular treatment of the cases analyzed. It is here seen that 108 cases were seen only once, many of them in consultation, and 68 for one month or less, a total of over one-third of the whole number; while of the cases which were treated at all there were 231, or nearly one-half that were under treatment for only one year or less. This, as will be seen later, is far less time than is necessary to overcome the tendency to the disease. Of the 170 cases, or 33 per cent. that were under observation for a period of over one year, my records show that very few of them pursued treatment faithfully and continuously for a lengthened period of time, but were seen now and again, as fresh eruptions or other reasons led them to seek medical advice. It will be noted that

some patients were under observation for very many years, and in certain instances in which it was possible to carry out efficient treatment, general and local, the permanent results have been very satisfactory. But with the uncertainties of an office and consultation practice it is evidently impossible to make any definite statements in regard to permanent cures; in a limited number of cases, however, that have been heard from or seen from time to time, it is believed that the tendency to the disease has been eradicated by complete, prolonged treatment, the patients remaining free from eruption.

It is not surprising that psoriasis should be rebellious, and the eruption apt to recur, when we compare it with certain other diseases whose chronic character is accepted, but which are known to be amenable to prolonged treatment, perfectly directed in every respect. It is within the memory of many of us when syphilis was regarded as incurable, and when physician and patient were content to meet and remove symptoms as they recurred, and we were constantly seeing patients with this disease presenting repeated lesions, even for many years. But now the laity, as well as the profession, have pretty well accepted the fact that proper and sufficiently prolonged treatment will eradicate syphilis, and we no longer have presented to us the sad and distressing late ravages of the disease, in the frequency with which we met them some years ago. But this change has been accomplished only by recognizing and accepting the fact that the patient must submit to a continuous course of treatment, with intermissions, perhaps, but only as directed by the physician, for at least two years, and often for three or more years; and also that faithful treatment is necessary as early in the course of the disease as possible. Or, take the case of gout and rheumatism. There are certainly fewer individuals with the severe chronic forms of these diseases than formerly, because patients have learned from physicians that they must take prolonged treatment, and guard their mode

of life during a considerable period, or even indefinitely, if they wish to escape from these troublesome and rebellious affections. The same may be said of chronic bronchitis and asthma, and sufferers from these maladies go to infinite pains in many directions, including great climatic experiments, in order to get relief. All are familiar with the satisfactory results which can often be obtained in diseases of the hip and spine by prolonged proper treatment, constitutional and local.

In regard to some affections of the skin it is likewise recognized that greatly prolonged treatment, and careful dietary and hygienic measures may be necessary in order to overcome the tendency to the eruption. Thus, eczema will often persist continually, or with exacerbations, for years, until by proper, faithful, and persistent medical supervision, perhaps for years, the susceptibility to its recurrence is conquered. The same may continually be observed in regard to acne, which has persisted into adult life, and also with regard to urticaria. All of these illustrations apply to the proper treatment of psoriasis. For, while we are not yet prepared to state the exact nature of the disease, or the immediate underlying causes of the eruption, any more than we can of eczema or some other general disease, we know enough of the clinical history and many other matters, to enable us to assert the soundness of such a deduction.

Psoriasis is not a local disease of the skin as is epithelioma. Psoriasis is not a parasitic disease of the skin in the ordinary acceptance of the term, as has been abundantly shown by the conflicting studies of many observers. Psoriasis is not a self-limited disease of the skin; when once developed it has no natural tendency to disappear, while the patient remains in the same condition of life. Psoriasis is not permanently curable by local treatment alone; and if we ever hope to overcome the disease, it must be by measures of some kind other than local.

IS PSORIASIS HEREDITABLE?

Psoriasis is often spoken of as an hereditary affection, but a study of the recorded histories here analyzed, of the more intelligent class of patients in private practice, seems to show that this is not an important feature in any proportion of the cases, as is shown by Table 5.

TABLE 5.

HEREDITY, 509 CASES.

Psoriasis:	Father.	Mother.	Patients.	Per cent.
Patients with anterior heredity.	28	49	47	.09
	Sons.	Daughters.	Patients.	
Patients with posterior heredity.	8	10	18	.03
Described as family disease....	..	..	9	.01
Neither anterior nor posterior heredity	..	..	308	.60
Heredity unknown or unrecorded	..	..	127	.25
Patients			509	

	Father.	Mother.	Patients.
Having parents with psoriasis	25	16	41
	Grandparents on:		
	father's side.	mother's side.	
Having grandparents with psor.	3	3	6
	Sons.	Daughters.	
Having children with psor....	8	10	18
	Brothers.	Sisters.	
Having brothers or sisters.....	30	28	58
	Father and	Mother and	
Gout and rheumatism:	father's father.	mother's father.	
With anterior heredity.....	17	12	29
Eczema and dermat. seb.:	Father.	Mother.	
With anterior heredity.....	14	14	28
	Brothers.	Sisters.	
Having brothers and sisters..	6	8	14
Asthma:	Father.	Mother.	
Having parents with asthma.	2	..	2

Thus, in 305 cases, or 60.75 per cent., concerning which inquiry was made, there was no anterior or posterior heredity; and in 127 instances no statements were recorded. If we allow that 60 per cent. of these latter, or 76 patients, had also no hereditary history, it makes a total of 384, or over 75 per cent., in which the disease showed no hereditary influence. Of the patients in regard to whom any anterior hereditary influence was observed, there were only 41, or .09 per cent. who had 25 fathers and 16 mothers affected, and six who had three

grandfathers and three grandmothers affected; of those with posterior heredity, there were only 18, 8 of whom had sons and 10 had daughters affected. There were also 58, 30 of whom had brothers, and 28 who had sisters affected. In regard to 9 patients it was recorded that psoriasis was a "family disease." It is not possible at present to state how many children of psoriatic patients escaped the disease, as these were not tabulated; but from casual inspection of my notes, and from memory, it can be confidently stated that there were many hundreds, many of them coming to advanced years, who never showed any signs of the disease.

It is recognized, of course, that these figures are not as absolutely reliable data in regard to the hereditability of psoriasis as could be desired, for naturally the knowledge or memory of the patient or friends can often be at fault, and frequently very searching and accurate questioning is not made. But as they relate to patients in the higher walks of life, in private practice, and as full and careful notes have been preserved in regard to every case, it may be pretty well accepted that the disease shows hereditary influence in not over one-quarter of the cases. This proportion might readily be expected when we consider that parents and children are commonly under the same influences of climate, hygiene, diet, and whatever may tend to produce the disease. It is, however, so constantly observed that many children in a family will escape, and only one be affected, that it is evident that true inheritance does not play a great part in the genesis of the eruption. It is reasonable to suppose that when the disease does exist, a tendency to it may be hereditarily transmitted, as other tendencies and peculiarities are handed down through generations. I am inclined to believe that, as in eczema, gout, asthma, tuberculosis, etc., it is a weakness of tissue that is inherited, which renders it susceptible to the true exciting causes of the eruption, rather than any specific disease element which is hereditarily transmitted.

ETIOLOGY.

When we come to consider what is the real cause of the eruption we are confronted with a difficult task, for as yet no accurate studies have afforded an adequate answer. The eruption has been carefully studied microscopically by many competent observers, but thus far these studies throw no clear light on the true nature of the disease. Great activity is found in the epithelial elements of the skin, with rapid keratinization; but there is also dilation of the blood vessels in the papillary layer, even in a very early stage, while later, there is perivascular cell extravasation, even deep in the corium; and observers are not agreed as to which occurs first, in point of precedence. Many claims have been made of a parasitic element, but no specific organism has yet been demonstrated, only such as are commonly found on the skin, more or less modified by their surroundings.

It is reasonable to suppose that there are many causative elements concerned in the production of the eruption in psoriasis, as in other skin affections, and I am prepared to accept a micrococcic agent as one of the direct exciting causes of the separate lesions: for, it must be acknowledged that their clinical appearance and mode of development and extension all strongly resemble the results produced in the skin by the trichophyton. It is also not a little striking and impressive that most of the local remedies of value in psoriasis are such as have decided parasiticidal action. Chrysarobin was first used, in the form of Goa powder, for ringworm.

But, as stated, no specific parasite has yet been demonstrated, and we have to fall back on the pathogenic effect of some of the many ordinary cutaneous micro-organisms, which are almost omnipresent: even as we see the lesions of scabies and eczema becoming pustular, in certain subjects whose tissues afford a proper nidus for the coccus, which does not seem to affect other skins. For we know that micro-organisms which are ordinarily

harmless may take on pathogenic action under suitable circumstances. When, therefore, the skin by inheritance is peculiarly liable to such invasion, and ready to take on diseased action, the micro-organisms which are continually lodged in the skin (as is evident from many experiences relating to surgery), excite the changes of psoriasis in the epithelial cells, if all other conditions are favorable.

Exactly what all these other conditions are it is impossible to state, for neither clinical nor laboratory work has as yet demonstrated just where the fault lies. But there are many features connected with the disease which seem to point to a constitutional state or condition which, at one time or another, favors the development of the lesions, and which can not be ignored. Thus, the intermittent character of the eruption, often without treatment, shows some change in the individual which even on the theory of a microbic origin of the lesions, causes the omnipresent micro-organisms to have effect. The same may be said in regard to the well-known proclivity of the eruption to appear at certain seasons, at which we know that the diet varies greatly, as well as the mode of life, all of which may modify greatly the metabolic processes on which the state of the tissue depends.

Most writers speak of psoriasis as occurring in persons in the best of health; but from a study of many cases in private practice, often over long periods of time, I am convinced that this is not the case, and that there is always some departure from the normal which can and should be discovered and reached if the disease is really to be cured. In many instances the eruption depends wholly on pure debility, and a prolonged and most careful tonic course, with iron, etc., will ultimately overcome the difficulty. In the gouty and rheumatic class of cases undoubted benefit results from a protracted and faithful alkaline course of treatment, with such dietary, hygienic and medicinal measures as meet the underlying

blood state. In a certain proportion of cases a strumous habit will be at the bottom of the trouble, and cod-liver oil, phosphates, etc., will be needed, occasionally with alterative doses of mercury.

It would be possible to demonstrate all these points by illustrative cases, but time forbids. But I may state that it is only by the most careful study of everything pertaining to the life and health of the individual, and by complete and repeated note taking, over periods of time, that the real condition of psoriatic patients can be understood and properly treated, as, indeed, is true of many other chronic complaints: and I am sure that if this were habitually done, these matters would be as evident to others as they have been to me for many years.

Some writers claim that the disease is only a very late manifestation of syphilis, either acquired or inherited, and it is, indeed, surprising how a well defined psoriasis will sometimes melt away under efficient mixed treatment, or under iodid of potassium alone. But I can not share in this view of psoriasis, and recognize in such therapeutic results only a modification of the faulty metabolism induced by these remedies, even as eczema in children will often yield so remarkably to the proper use of calomel and soda.

From constant study of these cases I am convinced that faulty metabolism is at the bottom of psoriasis, and I believe that sufficient care can commonly demonstrate this in a considerable proportion of patients. The urine is a most important and valuable indication of the manner in which metabolism is carried on, and should be frequently and completely investigated in psoriatic patients. I do not refer to the discovery of sugar or albumin, but to a perfect knowledge of its relative and absolute quantity, its volumetric acidity and specific gravity at various times, and the exact amount and character of its many possible ingredients, etc. Deficient and defective urinary secretion will explain very many other-

wise obscure and rebellious conditions of the system: it is understood, of course, that it is not believed that the kidneys themselves are necessarily at fault, but that the condition of the urine affords an indication as to how the metabolic processes have been previously carried on in various parts of the system.

This is a very large subject and can not be entered on further at this time, and I must refer to what I have already written on the subject.[3] But I will briefly refer to two very striking cases which have recently been under my care: A woman, weighing 163 pounds, with inveterate psoriasis, had passed only 13 ounces of urine the day before her visit, and at times has passed as little as 11 and even 7 ounces in the 24 hours, and yet was thought to be and appeared in perfect health. Another, a young woman, aged 21, weighing 138½ pounds, who had had psoriasis eight years, passes at times enormous amounts of urine, with great frequency and urgency day and night, and again a scanty urine of a specific gravity of 1,041 (no sugar), and an acidity, as measured, of almost four times the normal degree, and with 4.3 per cent. of urea, over double the normal amount. Surely the perturbations of metabolism manifested in these two patients can not be without effect on the condition of the skin. Moreover, the effect of intelligent treatment, dietary, hygienic and medicinal, on these and other patients, has demonstrated to a nicety that there is an intimate relation between metabolic conditions and the eruption on the skin.

Very recently, at the New York Skin and Cancer Hospital, one of the most rebellious and distressing cases of psoriasis that I have ever seen, has changed in a remarkable manner by internal treatment along metabolic lines. The patient, a woman, aged 32, has had characteristic psoriasis for very many years, and has been in the hospital for months at a time, the disease resisting every con-

3. "Relation of Diseases of the Skin to Internal Disorders," Rebman & Co., New York. 1906.

ceivable form of treatment. A month ago, when the eruption had affected almost the entire surface, many large areas suggesting dermatitis exfoliativa, she was given four drops of strong nitric acid, internally, well diluted, three times daily, after eating. The good effects were apparent very soon, and the eruption has steadily faded, leaving most of the surface in a normal condition, and this with relatively little of the same, rather mild, local treatment which she was previously using without effect. What the ultimate results will be can not yet be judged, but, in all my experience I have never witnessed such a startling result from a single internal therapeutic measure in psoriasis.*

TREATMENT.

The treatment of psoriasis, as may be judged from what has preceded, may cover a very wide range of measures, and it is readily understood why arsenic is not always successful in controlling the disease. And yet arsenic is considered by many as about the only remedy in this disease, and assuredly, in certain cases it will often control the eruption in a very satisfactory manner. Its mode of operation is by no means fully understood, although it is commonly credited with having a more or less definite action on the epithelial elements of the skin. This may be so, but to my mind it is more logical to explain its effect through the agency of the general nutrition: for arsenic is equally recognized as a nerve tonic, controlling chorea and neuralgia to a marked degree, and is also of value in chronic malaria and in many conditions of debility.

The internal remedies which may, at one time or another, be used with advantage in the treatment of psoriasis, embrace a fair proportion of these in the Pharmacopeia, and it is impossible even to mention the

* At the date of correcting proof, four months later, I may add that the dose has been gradually increased until she is now taking about ten drops of the strong nitric acid, three times daily, with the entire absence of the eruption, when seen to-day, and with no local treatment for a long time.

many which from time to time have been brought forward. The truth is that each and every one of them has probably been of service in one or more cases, which happened to be suitable for it at the time.

It is here that the correct treatment, looking toward a cure of psoriasis comes in: namely, in studying the patient at each visit, and determining the proper line along which to operate at that particular time, for undoubtedly constitutional conditions change from many causes, and treatment should be varied accordingly.

Moreover, it is well to remember what was said a while ago in regard to the obstinacy of the disease, and the length of time often required to overcome syphilis and many other chronic conditions. In my judgment there are many failures in psoriasis which are due to irregularity and intermissions in the constitutional treatment, or cessation of the same. Although the eruption of psoriasis may often be removed relatively easily by local measures, the patient is by no means cured, and it is often a disadvantage to have the eruption too quickly removed by local means, as it renders the patient careless and unwilling to pursue the dietary, hygienic, and medicinal treatment long enough to effect a cure.

As may be inferred from what has preceded, I have no single remedy or treatment to present or advocate, nor do I believe that such will ever be found: for there is no specific element to overcome, as in syphilis and malaria, nor any parasite that can be eliminated, once for all, as in scabies and favus. But I do plead for a more careful and prolonged study and control of the psoriatic patient, in all particulars, and such a regulation of the life, and such a use of all the measures known to the science and art of medicine, as shall suffice to change the constitution to that degree that, although the eruption may possibly threaten at times, it need never prove a serious matter: and, as before stated, I believe that this can be done in a very much larger proportion of cases than has hitherto been generally believed and

accomplished, and that even the tendency to the eruption can often be entirely overcome.

As in the case of gout and chronic bronchitis, the psoriatic subject must recognize the existence of a disease of deep-seated nature, which will require the best efforts of the physician and patient, over a long period of time, in order to have it effectually overcome. I commonly fix two years (it may be longer) as the least period to be considered at first; and then, if after that the patient relapses into exactly the same mode of life and condition of system as previously, there may be a threatening of the eruption. But if, with its slightest recurrence, energetic measures are at once taken and continued, the trouble may be avoided, as I have observed time and again.

Time forbids going at length into the details of constitutional treatment, so different are the cases, but a few words of suggestion may be given. Mention has already been made of the excellent results sometimes obtained by antisyphilitic treatment, even when no specific history can be obtained, also of the disappearance of the eruption under the free use of nitric acid internally. In full blooded plethoric cases, tartar emetic in increasing doses, to toleration, given six times daily, with nux vomica and quassia, has cleared up a number of my cases in a surprising manner, without local treatment; but this needs to be followed by a tonic course of iron and arsenic, and perhaps returned to again. In cases in which debility was evident, a strong course of iron and arsenic, with bitter tonics, has had like effect, and the same has been accomplished with cod-liver oil, in suitable cases. There are also many patients in whom arsenic alone, in efficient doses, suffices to keep the disease in abeyance.

Arsenic is so well known that little need be said concerning it. I have never had occasion to regret its use in suitable cases, and have had patients who consumed large quantities with only beneficial results.

The greatest consumer of arsenic was a clergyman, under my care more or less for twenty years, beginning at 30 years of age, when he had already had the eruption eight years. He calculated that sometimes he took almost 8 ounces of pure Fowler's solution in the course of a single year, and over half a gallon, in drops, in the course of fourteen years. But arsenic does not suit every case nor every stage of the disease. As is well known, it sometimes stimulates the eruption to increased activity, and is seldom of value in its acute or developing stage, but rather aggravates it.

Alkalies, properly used, and such remedies as promote a perfect urinary secretion, are of the utmost value in most cases of psoriasis: and it is here that the value lies in most of the mineral waters used at the springs or at home. But to be really effective they should be administered with a repeated and perfect knowledge of the kidney secretion, as shown by quantitative analysis. The urine should not be kept alkaline, but somewhat below the normal acidity. Acetate of potassium, combined with nux vomica, and the fluid extracts of dulcamara and rumex, is most valuable, especially in the most congestive forms of the eruption.

Diet, undoubtedly, has much to do with psoriasis, and should always be most carefully attended to. Alcohol in any form, even the lightest wine or beer, is prejudicial and must be absolutely avoided. Whatever may be the mode of operation, there is no question in my mind, from repeated observations, extending over many years, that meat, especially if freely indulged in, increases the liability to and severity of the eruption, as I reported ten years ago;[4] and I am more convinced in regard to this than at that time. For many years I have placed numerous psoriatic patients on a strictly vegetarian diet, with most excellent results; and these results are further corroborated by the fact that now and again, when one has broken through the regulations, he or she has reported with a recurrence of the eruption. I make the diet ab-

solutely vegetarian, not even allowing eggs or fish, or milk as a beverage, with eating; and sometimes I have even excluded coffee and tea with advantage. Excess of sweets also tends to increase the eruption in psoriasis, and these should be greatly restricted: moreover, as the eruption is often increased by dyspepsia I see to it that pastry or articles exciting indigestion are also avoided.

Hygiene has a certain bearing on psoriasis, and in an effort to secure a cure of the disease it should always be controlled. This can not be gone into fully here, but if, as I believe, faulty metabolism is the bottom cause of the malady, every item which can conduce to its perfect performance should be attended to: and unless the physician investigates and directs this, the patient will be apt to live just as before. I have elsewhere reported psoriasis profoundly affected by the condition of the nervous system, the eruption appearing with each nervous breakdown, and we all know of the recurrence of psoriasis in connection with lactation. Temperature has much to do with the eruption, as it frequently disappears on removal to a warm climate, and the disease is relatively seldom seen in the tropics.

In regard to local treatment I have little to say, except that I agree with the most radical localists, in regard to the importance (although not relative importance) and effect of local therapeutic measures; no one who has seen much of the disease could rightly do otherwise. The rapid removal of a long standing and rebellious eruption of psoriasis by the proper use of chrysarobin, of good quality, is certainly a striking evidence of therapeutic power; but we all know the objections to chrysarobin, and often it is not feasible to employ it in private cases in an efficient manner. Sometimes, however, the eruption does not yield to it, and occasionally it fails owing to an inferior quality of the drug. I need not take time to enter into the details of other local treatment, which

4. Trans. Third Internat. Dermatol. Cong., London, 1896, p. 734.

are well given in literature, almost every variety of which I have, at one time or another, used in private or public practice. As in all other cutaneous maladies the application has to be fitted to the case, and varies according to the character and stage of the eruption, and time forbids further consideration of the subject. But I would like to say a few words in regard to the treatment of the eruption by the *x*-rays, in which I have had some interesting experiences. They are by no means suitable to every case, although as yet I have had no unfavorable experiences, except one, among a considerable number of cases thus treated, in part. In this patient, a man aged 55, there was a slight burn on the abdomen, with the same strength of application used elsewhere: but this healed soon, and the results elsewhere had been so favorable that he insisted on having the *x*-ray still employed on other patches, even while this was sore. I have used it only on older, more chronic lesions, and have repeatedly seen a single application of medium intensity remove a patch entirely. It often leaves a brownish stain, which persists some little time. I have had cases in which, although new eruptions developed elsewhere, the portions which had been treated by the *x*-rays remained free. As an adjunct to the local treatment of psoriasis, in proper cases, I consider this new measure a most valuable addition to our armamentarium.

CONCLUSIONS.

In conclusion I would emphasize the following points in regard to the disease under consideration:

1. Psoriasis is not a purely local disease of the skin, but has constitutional relations which are most important.

2. Psoriasis is not a parasitic disease of the skin, in the usual acceptation of the term; it is not contagious, nor has it a definite micro-organism. But probably the immediate lesions on the skin are caused by the growth of some of the ordinary micro-organisms usually found

on the skin, which take on a pathogenetic action when the soil is suitable.

3. Psoriasis can not be cured permanently by local treatment alone, although when properly directed this is commonly capable of removing existing lesions, which are likely to return.

4. In some instances in which local treatment seems to be followed by success, the eruption may be seborrheic dermatitis, which in some of its phases closely resembles psoriasis.

5. Hereditary influence is a relatively unimportant factor, not operative in more than one-quarter of all cases: even in many of these instances but one child may be affected among many healthy children.

6. Psoriasis is not a late manifestation of syphilis.

7. There is no one tangible internal cause of psoriasis, though faulty metabolic changes are probably at the bottom of every case, and these may be induced in many ways.

8. The repeated and thorough volumetric analysis of the urine is a most valuable aid in determining the line of proper treatment in different cases, and at different times.

9. There is no one internal remedy universally of value in psoriasis, although arsenic is the single agent of most service in the greater number of instances. Arsenic is safe, if properly used, and may be taken for a long time with only beneficial results: but it commonly requires to be employed in conjunction with other internal measures, or alternated with them. In acutely developing psoriasis it often acts badly, increasing the eruption.

10. In a large share of cases alkalies, if properly used, are of the greatest value in psoriasis.

11. The avoidance of meat, or an absolutely vegetarian diet, is a most valuable aid in treatment, and sometimes will be attended with freedom from the eruption.

12. Psoriasis is an exceedingly chronic and rebellious

disease and effective internal measures must be continued for a long time, generally for at least two years, to ensure a cure.

13. Local treatment is of the greatest value in the removal of the eruption present, but its temporary success should not interfere with the persistence in proper internal measures for a length of time, even when no eruption exists. The eruption can also disappear under the strictest proper internal treatment, without the aid of any local measures.

14. The *x*-ray is a most valuable adjunct to local therapeusis, and is sometimes capable of removing chronic lesions even by means of a single application.

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DISCUSSION.

DR. FREDERICK A. RHODES, Pittsburg, Pa., said that a few years ago he sent a letter to a number of dermatologists in this country asking what, in their experience, is the ratio of psoriasis to other skin diseases; also, to what diseases, in their opinion, it is especially allied, and their views, in a few words, as to prognosis, etiology and treatment. To most of these letters he received courteous replies, but after summing up the conclusions he was no better off than before. He is particularly interested in psoriasis because for 6 years he has been a sufferer from the disease. In 1899 he first noticed a small, papular lesion on the inner surface of the left ankle, above the malleolus, which he did not consider seriously. It remained as a single lesion for a number of months. About that time, on account of an epidemic of smallpox in the neighborhood, he re-vaccinated himself a number of times, but with no result. In the course of a few weeks, however, a number of new psoriatic lesions developed, and within three months there were numerous patches from the knees to the feet, and a few isolated lesions on the thighs and arms. Dr. Rhodes said that some of the leading dermatologists hold the view that vaccination will arouse a latent psoriasis, and a few years ago, in the *British Journal of Dermatology*, a series of cases was reported in which the claim was made that vaccination is the cause of the disease. Dr. Rhodes said that he does not agree with the view that it can be the real cause, but believes it can arouse a latent one.

During the first year after his psoriasis developed it was worse than it has been at any time since, and the scaling was very free. He tried various methods of treatment with-

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out avail, and stated that if one were to try all the remedies that have been recommended in this disease, it would practically include the entire pharmacopeia. He tried the different local remedies and arsenic internally, with no other effect than to alleviate the symptoms to some slight extent. Finally he came to the conclusion that the eruption is the result of metabolic disturbance, and in spite of the fact that during the past three or four years he has done practically nothing in the way of treatment, a gradual improvement has been noticed. The eruption is worse during the winter months; in February and March the lesions usually increase in size and number, and with the onset of the warm weather an improvement is noticed. While the *x*-rays have given good results in some cases, he is of the opinion that exposure to sunlight has been equally efficacious in his cases. The fact that there are so few cases in tropical countries, with benefit of warm sunlight when tried, tends to show that the eruption is caused by some disturbance of the vasomotor system, probably of the vasodilators, the action being reflex and irritant due to metabolic products circulating in the blood. Dr. Rhodes said that a peculiar feature in connection with his own case is that at the time the disease manifested itself he had an attack of gastralgia which persisted as long as the eruption was severe, and there have been recurrent attacks of the gastralgia coincident with the outbreaks of psoriasis. In conclusion he stated that the attacks, both in time of appearance and physiologic action, resemble very much those of chorea, another disease of doubtful etiology. In chorea the irritating effect is manifested through the motor nerves, while in psoriasis the manifestation is seen in those nerves when modified by sympathetic ganglia

Dr. Charles P. Sylvester, Dorchester, Mass., reported a case of psoriasis which resisted all external and internal medication, but was rapidly cured by laparotomy and curettage. The patient was a married woman, aged 27, a blonde, who had always been strong and healthy, except for a constant leucorrhea following the birth of a child 6 months before. Her bowels were regular; menstruation was normal, but rather free. She was fond of candy. In March, 1903, she had a severe attack of tonsillitis which so closely resembled diphtheria that 5,000 units of antitoxin were given while awaiting culture reports, all of which were negative. Five weeks later, punctiform macules appeared on the face and body, which were scaly and itching in character, with lameness of the muscles and painful joints. The patches slowly increased in size and number until almost the entire body, including the scalp and face, but excepting the palms and soles, was covered with the lustrous, scaly patches, some of which, around the umbilicus and sacrum, coalesced to form areas as large as the palm, while most of them did not enlarge

to the size of a dime. Various internal and external remedies were used without much effect, including mercury and potassium iodid, as the sore throat, followed by the eruption, suggested syphilis. The subsequent history, however, eliminated that disease. Vaginal examination revealed a large, retroverted uterus, with a polypus projecting from the external os, and a small fibroid on the posterior wall of the fundus. The cervix was slightly torn on the left side. There was an offensive, viscid discharge. An operation was advised for the removal of the tumors, for restoring the normal position of the uterus and relieving the leucorrhea, and as the best chance of curing the psoriasis. The patient refused surgical treatment. The disease assumed more and more of a chronic nature, until finally 6 months after its appearance, it began to fade gradually, and in January, 1904, it had entirely disappeared. The following September it again appeared, and progressed steadily until December, when the patches were thicker and more hyperemic than at any time during the previous attack, and her face was so involved that she would not venture outdoors. An operation was again strongly advised, and this time the patient consented. She was taken to the Moultrie Street Hospital, Dorchester, and on January 4, 1905, after curetting the uterus and removing the polypus, Dr. Sylvester performed a laparotomy, removing a small fibroid and attaching the uterus to the anterior abdominal wall. Four days later the eruption seemed much improved, and in two weeks it was no longer visible on the face. She made an uneventful recovery from the operation, and on the fifteenth day left the hospital. On March 1, less than two months after the operation, there were no visible signs of the eruption, except a slight erythematous appearance about the umbilicus and sacrum, where the most indurated patches had occurred. Up to the present time there has been no recurrence of the psoriasis or the leucorrhea, and she is in excellent health.

Dr. Sylvester said that psoriasis, in his opinion, is not of parasitic origin, nor is it an inherited sequel of syphilis, tuberculosis, rheumatism or gout. It is a manifestation of a toxicosis, and the case he reported together with others he has seen following vaccination and scarlet fever is in accord with that theory. Either the streptococcic infection of the throat, the administration of the antitoxin, or the infected endometrium, one or all, on the one hand, or the reflex irritation of the retroverted uterus and the presence of the tumors, on the other, furnished the cause. Relieving the leucorrhea, which was kept up by the polypus and the displaced uterus, in all probability effected the cure. A laparotomy diet for one or more weeks may not be without beneficial effects if psoriasis is due to an autointoxication.

DR. WILLIAM S. GOTTHEIL, New York City, said that the position taken by Dr. Bulkley marks a reaction against the purely local treatment of psoriasis which the Vienna school has long advocated. There are certain cases, no doubt, in which metabolic conditions are connected with the appearance and persistence of the eruption, but there are also a large number of cases in which nothing abnormal can be detected in the constitutional states of the patients. He recalled one case under his observation, the wife of a physician, who suffered from a recurrent attack of psoriasis every time one of her children was ill, or when she was worried from any other cause. When such an attack came on she was isolated in a room on the upper floor of her home, she was not allowed to be harassed by any household cares, and with practically no other treatment the eruption rapidly disappeared. Dr. Gottheil said that arsenic is beneficial in many cases of psoriasis, especially when given hypodermically and in large and increasing doses. His favorite preparation is a 1 per cent. solution of sodium arseniate, repeated every day or every other day, until 40 drops are given in the course of 24 hours in appropriate cases. Externally, the preparations of tar are as useful as chrysarobin, and are much more commonly employed in Germany than in this country. Dr. Gottheil said that he has no doubt the *x*-ray is beneficial in some cases, but he has yet to see the psoriatic patch that will not respond to proper energetic local treatment. He agreed with Dr. Bulkley that it would be a good thing if patients with psoriasis would consent to remain under treatment for 2 years or more. The majority of them, however, grow impatient unless they obtain prompt relief. The practical conclusion is that these patients are relieved but not cured, and that a recurrence can usually be confidently looked for.

DR. FRANCIS J. SHEPHERD, Montreal, said that he is inclined to agree with those who attribute psoriasis to some fault in the metabolic processes, at least in many of the cases, if not all, even though it can not be detected. He referred to a case he saw a number of years ago, which was interesting in connection with a meat diet and its bearing on this form of eruption. The patient was an officer in the Hudson Bay Company who lived far north, and for about 10 months in the year subsisted on a meat diet almost exclusively. He had a very extensive psoriatic eruption, which disappeared permanently after he removed to Montreal, and gave up his meat diet. Dr. Shepherd also mentioned another case, that of a man who at times drank wine to excess, even indulging in prolonged sprees. At such times he had severe outbreaks of psoriasis, the eruption disappearing when he stopped drinking, and recurring with the onset of the next spree. Dr. Shepherd said that he is convinced that vaccination at times determines the outbreak of psoriasis in predisposed individuals, although

if vaccination had not been the exciting cause, no doubt something else would.

Dr. James C. White, Boston, declared that he always tells his patients that psoriasis is in one sense an incurable disease. Some persons may have only one attack; others may have repeated attacks, and he does not believe that any medicine, either internal or external, will radically change the course of the disease to any material degree so far as its recurrence is concerned. In dealing with an affection which is capable of spontaneous disappearance, it is perhaps erroneous to draw deductions from its non-recurrence following any course of medication. Moreover, the course of the disease is so irregular and uncertain that it is difficult to draw conclusions as to whether or not it would recur after this or that method of treatment. With increased experience, he said he becomes less and less confident as to the value of internal remedies in this disease. He gives arsenic less than in former years, and in the chronic form of the disease he is inclined to rely more on potassium iodid. In acute cases he gives no internal remedies, except perhaps some alkaline preparation. Dr. White said that many years ago a statement was made by a physician of authority, who cited a large number of cases to prove his assertion, to the effect that the disease is curable by the use of an exclusively vegetable diet. A year or so afterward another, equally distinguished, put all his psoriatic patients on an animal diet, and his results were just as good. The important factor in the treatment of psoriasis, Dr. White said, is to put all the patients into as good a condition as possible. Psoriasis has been called the skin disease of health, because it is observed so frequently in patients who are otherwise perfectly healthy. He said that in some cases, but not in all by any means, the results of the use of *x*-rays are marvelous, even in cases that have resisted every other method of treatment. In those very same cases the eruption may recur and the *x*-ray treatment prove without effect. Thus it is that the *x*-ray has only added one more uncertain remedy in the treatment of this disease.

Dr. W. D. Calvin, Fort Wayne, Ind., called attention to the fact that he has seen a psoriatic eruption disappear while the patient was suffering from pneumonia, only to reappear later. He has observed the same phenomenon during the course of an attack of inflammatory rheumatism, and has recently heard of an instance in which it disappeared during typhoid fever. These experiences seem to indicate that psoriasis is not the result of various kinds of intoxications, but of a special poison. He has seen cases in which the eruption yielded to almost anything; in others it persisted in spite of various methods of treatment. He has never resorted to the *x*-ray treatment in psoriasis, but has always endeavored to put the patient in as good a physical condition as possible, correcting

errors of diet, methods of living, etc., but none of those measures has proved very satisfactory.

Dr. Gardner T. Swarts, Providence, R. I., said that acting on the theory that psoriasis is due to metabolic disturbance resulting from a deficiency of some of the glandular secretions, he has administered thyroid extract in a number of cases with apparently satisfactory results, only to have the eruption recur and disappear again under the use of potassium iodid, hydriodic acid, or alkaline treatment. Whether the various remedies that have been recommended ever cause the eruption to disappear, or whether the improvement is due to Nature, or to the peculiarity of the disease he said he would leave to the members of the Section to decide.

Dr. John B. Kessler, Iowa City, Iowa, said he is rather inclined to favor the use of salicin in preference to arsenic in the treatment of psoriasis. His experience with the *x*-rays in the disease has not been satisfactory. He asked Dr. Stelwagon what his experience has been with carbolic acid in the treatment of this condition.

Dr. Henry W. Stelwagon, Philadelphia, said that he believes that heredity, either directly or indirectly, exerts some influence on the development of this disease. In any predisposed person, any ill condition of health accompanied by fever may also be a contributing factor. There are many other contributing factors, but they should not be mistaken for the cause of the disease. In the treatment of psoriasis, the first essential is to put the patient in as perfect a condition of health as possible. The fact that the psoriatic eruption may disappear temporarily during the course of the acute exanthemata or any febrile condition is true not only of psoriasis but also of many of the inflammatory dermatoses, including eczema, dermatitis herpetiformis, etc. Dr. Stelwagon declared that he was surprised to hear that reference had been made, even negatively, to the possible relationship between syphilis and psoriasis. He had supposed that that question was settled long ago, and that the view that there is any association between the two diseases is obsolete. It is well known that psoriasis is a chronic, general disease, bearing no relation to syphilis. In regard to the various remedies and successful methods of treatment that have been loudly proclaimed at different times in psoriasis, Dr. Stelwagon said that, in his opinion, the result of treatment depends largely on the time of year when the case comes under observation. Take, for example, a patient who, during the winter, has been under the care of various physicians without being benefited. About May or June, at the approach of warm weather, when the disease shows a natural tendency to improve, he perhaps makes another change in his physician, and under almost any remedy the eruption often disappears, due largely to the seasonal influence. Dr. Stelwagon is in the habit of telling

young men who suffer from psoriasis that they should reside in a warm climate, because the disease, as known in the north, is often extremely persistent and rebellious; but that it can be temporarily cured, though a recurrence is very apt to take place. In many psoriatic patients who have never taken arsenic, the drug seems to act almost like a specific. Thyroid extract is beneficial, but it has so many unfavorable effects that it is withheld until absolutely necessary. Carbolic acid, which was recommended long ago, in small doses, by Kaposi, has given good results in Dr. Stelwagon's practice during the past year, when administered in large dosage. He usually administers the drug in a 25 per cent. solution of glycerin and water, and gradually increases the dose until the patient is taking from 18 to 30 grains daily. The patient's urine should be watched for possible toxic action, but if the pure acid is used there are rarely any bad effects. Like other remedies, it gives the physician an opportunity of doing away with the arsenic treatment.

Dr. F. A. Kleinhans, Milwaukee, Wis., said that he has been a sufferer from psoriasis for 18 years, and has tried practically everything in the line of treatment both internal and external, the α-rays alone excepted. He is firmly convinced that psoriasis is not of parasitic or microbic origin, but is a cutaneous manifestation, due to faulty metabolism, in fact a sort of autointoxication. In sections of most recent psoriatic lesions excised from his own person, he has found a parakeratosis, i. e., a thickening of the horny layer and dilatation of the vessels of the corium and round cell infiltration surrounding the dilated vessels and the sweat coils. Among other methods he has tried the hypodermic use of arsenic (as Fowler's solution) and found it very painful. At times he can rid himself very readily of the lesions in the course of a week or two by taking 5 grains of bicarbonate of potash 3 times daily; at other times this remedy has no effect. Sometimes Fowler's solution proves beneficial and again it fails, or even aggravates the condition. Thyroid extract has also been tried without any effect. He believes that there is no one remedy that can be depended on in all cases at all times.

Dr. William L. Baum, Chicago, said he has always regarded psoriasis as a dermato-neurosis. In the first place, there is a distinct hereditary tendency to the disease, as it can be traced from generation to generation, following practically the same type as does a psychosis. The mere fact that so many remedies have been recommended by different authorities indicates that the opportune moment effected the cure rather than the remedy. He has frequently observed exacerbations of the disease after violent emotional disturbances. The eruption may disappear rapidly when the patient is placed under a different environment. This does not depend so much on the

climate, as the disease is observed in both warm and cold climates. In the majority of cases, the patients should be made to understand clearly that the disease is incurable, although in some instances it is limited to a single outbreak. Vaccination and injections of antitoxin may be exciting factors in causing an outbreak. In Cook County Hospital, Chicago, about 3,200 patients have been given injections of antitoxin and a decided number of the patients injected have returned with psoriatic efflorescences attributed to the antitoxin. Still, any other form of irritation might have the same effect. In over 70 per cent. of the patients who returned, Dr. Baum was able to get a history of psoriasis either in the parents or grandparents, or in some collateral branch of the family. In the treatment of psoriasis, the possibility of neurotic origin should always be remembered.

Dr. David Lieberthal, Chicago, said that all are agreed as to the difficulties connected with the management of psoriasis. It is difficult to have a patient carry out such strict diet as Dr. Bulkley demands. Dr. Lieberthal has under his care a patient with psoriasis who years ago was treated by Dr. Bulkley and freed from the disease through the diet treatment exclusively. But the patient remarked that he would rather keep his skin affection than undergo such a diet treatment again. It can not be denied, however, that regulating the diet of certain patients with systemic derangements will bring about good results. Dr. Lieberthal has under his care a patient who for 16 years was not relieved of his affection in spite of having had the benefit of the best dermatologic care here and abroad. The patient's urine was loaded with urates and uric acid and after his diet was accordingly modified, the skin cleared up and remained so until his death, 18 months later. It is important to see the patients at short intervals in order to observe the lesions and to control the internal administration of drugs. External treatment should be employed with due diligence and if chrysarobin is applied, it should not be allowed to spread to the normal skin, otherwise it is apt to produce a dermatitis, on the basis of which new psoriatic lesions may develop. Arsenic should be administered rather in older cases of limited area. If Fowler's solution is used a fresh preparation should be secured as the older becomes inert. Dr. Lieberthal said that he uses the α-ray in psoriasis, but only in the severe inveterate cases. Any treatment employed should be carried out until the last traces of the disease have disappeared.

Dr. L. Duncan Bulkley, New York City, said that he has used carbolic acid in psoriasis, and knows what it will do in certain cases. He thinks it entirely erroneous to regard psoriasis as incurable. He also disagrees with those who claim that it is impossible to get patients to live on a vegetable diet. He had one psoriatic patient who has been a vegetarian for

10 years, and a number who have abstained from animal food for from 3 to 4 years. He has seen psoriatic outbreaks following a shock or mental strain. In the treatment of psoriasis, patients should be kept under observation for a long time after the eruption itself has actually disappeared. The same thing is done in syphilis and in gout. Psoriasis can be cured in a certain proportion of cases. Those not cured are the ones in whom the basic cause of the eruption can not be discovered.

THE RELATION OF NERVE IMPULSE TO CUTANEOUS INFLAMMATION.

ERNEST L. McEWEN.
CHICAGO.

Of the many unsolved problems in the pathogenesis of skin diseases there is one which, by reason of the broad applicability of the points involved, is of pre-eminent importance, namely, the relation of the nervous system to cutaneous inflammation. To illustrate the diversity of opinion and general confusion which obtains on this subject a few instances may be cited. There is a condition called by the French *nèvrodermite*; it is regarded by them as a distinct disease entity of nervous origin, but by American dermatologists the pathogenesis given is not accepted and, therefore, the condition is scarcely recognized. The adherents of the Vienna school speak of *neurotische* or *reflectorische Entzündung* or *Dermatitis,* thereby conceding that an inflammatory lesion may have a nervous cause. Turning to authorities in our own language, a striking example of obscurity with respect to nerve relations in pathology is to be found in the text-book of a prominent author.[1] He devotes one short paragraph to the pathology of herpes progenitalis as follows:

"The presumption is in favor of the disease being due to a reflex irritation of the neighboring sympathetic ganglia through irritation of the sensory nerves of the part."

1. Crocker: Diseases of the Skin, third edition.

Far from being a clear-cut and complete elucidation of the pathology of the disease in question, this meager statement really throws no light on the subject, and coming, as it does, from an eminent authority its very deficiency in this respect makes it a confession of general lack of understanding of nervous relations in cutaneous inflammations.

These three citations: the *nèvrodermite* of the French, the *reflectorische Dermatitis* of the Vienna school, and the instance of vaguely expressed pathology of herpes, as understood by a great dermatologist, suggest the propriety of an inquiry along certain lines of pathogenesis in which the nervous system is a prominent factor. This inquiry may be introduced with a consideration of the Vienna idea. It is observed that the skin of an individual suffering with an acute localized dermatitis is often subject to a sudden outburst of a similar type elsewhere without an apparent external cause. These secondary appearances are regarded as reflex in origin, the explanation being that, in the absence of other causative factors, the nervous system acts as the effective intermediary agent in the spread of the disease from the primary area.

Analyzing this conception, the use of the term reflex is first to be considered. If its application be in a general sense only, without reference to any pathogenic relationship, its use, however convenient, is not to be commended, since the word reflex has a definite significance in medical parlance; if not used in conformity with this significance, it becomes at once misleading. On the other hand, if the term is intended to express a distinct etiologic fact, to show in a concise word a definite pathogenic relation, then its use postulates a certain proposition, the proof of which may properly be demanded, though perhaps not easily given.

By the expression dermatitis we understand, in a broad sense, an affection of the skin characterized by the clinical manifestations of inflammation. The term re-

flex as understood in medicine defines a physiologic complex, of which certain nerve structures and nerve impulses constitute the necessary elements. This complex in detail is as follows: An impulse passes along an afferent (sensory) nerve to a center whence it is reflected along an efferent (motor) nerve to a peripheral part, causing eventually some organ to perform its function. In the light of these definitions a reflex dermatitis may be said to be an inflammation of the skin the result of reflex nerve action; or, more strictly, of efferent nerve impulse, since that portion of the reflex act comprising the afferent or sensory impulse ends with the receiving center, and, irrespective of the nature of the stimulus producing it, is incapable of changing the fixed character of the efferent or motor impulse. From these considerations we are able to formulate the broader proposition, namely, that the pathogenic process called inflammation can be initiated through the medium of motor-nerve impulse alone.

This is a postulate which underlies the *nèvrodermite* of Brocq and Jacquet.[2] Its presence may be traced in a very appreciable portion of dermatologic thought today, because it lends itself so readily to the support of an obscure pathogenesis, a fact well illustrated in the quoted paragraph on herpes. It is a postulate which calls for proof. Its use and abuse will not diminish so long as its validity as a premise is accepted. But that validity is not so easily established as casual thought would expect; it is, therefore, in the interest of scientific accuracy in dermatology that the question be made a subject of discussion.

The problem, then, is this: Can the process of inflammation be produced by nerve impulse alone? Has a motor impulse, having its source in the conversion at a receiving center of a sensory impulse from the periphery, the power of creating the inflammation complex? If

2. La Practique Dermatologique,, vol 11.

these questions be answered in the negative, another arises: What additional elements are necessary to bridge the gap between the factor nerve impulse, sensory and motor, and the result inflammation?

Clinically, inflammation is recognized by the so-called classical symptoms—*rubor, calor, tumor* and *dolor.* These constitute the surface manifestations of a complex series of changes taking place within the tissues, in which the blood and its constituents, the blood vessels, and the fixed tissue elements all participate. The various steps in the process, approximately in the order of their development, may be described as follows: There is first a dilatation of the blood vessels; this is succeeded by a slowing of the blood current, with margination of the leucocytes; next occurs a passing outward of the white blood corpuscles and the fluid elements of the blood, with a varying number of erythrocytes, through the vessel walls into the surrounding tissue, thus forming an exudate; lastly, proliferative changes occur in the fixed tissue of the part.

A question here suggests itself: What is the essential element in inflammation? Or expressed in another form: Which one of the steps above enumerated must necessarily be present in order that the condition may be termed correctly inflammation? The answer must take into consideration the purpose of the process. Though regarded as a manifestation of disease, it is in itself unquestionably a conservative measure, having for its purpose, first, the removal from the organism of irritants which threaten the safety of the whole or its component cells, and, second, the repair of any damage that may have resulted. Such removal may necessitate actual destruction of the irritant by phagocytosis, its dilution or neutralization by exudate, or its encapsulation by connective tissue; repair is accomplished by proliferative changes in the tissue which has suffered injury. The process of inflammation fulfills these requirements.

The comparative value of the changes may be studied in avascular structures.[3] If the epithelium of the center of the cornea be damaged to a very slight degree, degenerative changes occur in the corneal tissue in the immediate neighborhood, but repair takes place without accumulation of leucocytes. If the injury be greater, repair is preceded by a massing about the lesion of leucocytes drawn, not from the circumcorneal blood vessels, which remain unaffected, but from the free wandering cells of the tissue. If, however, the injury done be severe, the vessels nearest the lesion dilate, diapedesis of leucocytes takes place, and fluid accumulates in the tissue. These findings would seem to indicate that in the work of repair and defense the impulse to proliferation ranks first and the migration of leucocytes second; vascular changes are subservient to the latter. It must be admitted, however, that authorities differ in their conception of inflammation. Metchnikoff[4] holds that it is the response of the organism to external irritation; thus, he would regard the process which followed the first and second instances of corneal injury cited above as true inflammation. Heinz,[5] on the other hand, considers that vascular changes are necessary and would reject these instances as not inflammatory. While Metchnikoff's conception has more in it to commend itself, it is immaterial which of the two is correct, inasmuch as we are concerned with vascular tissues. It is significant that the migration of leucocytes and fixed tissue proliferation are common to both conceptions.

To determine the exact part taken by nervous impulse in inflammation, a further analysis of the stages given must be made.

I. DILATATION OF THE BLOOD VESSELS.

The calibration of those vessels which are supplied with muscular coats is known to be under the control of

3. Adami: Allbutt's System of Medicine, vol. 1.
4. Metchnikoff: Comparative Pathology of Inflammation.
5. Heinz: Handb. d. exp. Path. u. Pharm., vol. 1, part 1.

the vasomotor nerves. These are of two kinds: vasoconstrictors and vasodilator. Stimulation of the former results in vessel constriction; paralysis of the former or stimulation of the latter leads to vessel dilatation. The principal vasomotor center has been located by method of spinal-cord section in the floor of the fourth ventricle; subsidiary centers are present in the cord, in the sympathetic ganglia and on the vessel walls. The constrictor nerves pass through the lateral sympathetic ganglia to their terminations in the vessel walls; the dilators have their relay stations in the great ganglionic plexus of the thoracic, abdominal and pelvic cavities, whence they are distributed to the vessels. The innervation of those blood channels not provided with muscular coats, i. e., the capillaries, is not so clear. It was formerly believed that they were not under nervous control, but more recently it has been demonstrated[6] that contractile cells are present in their walls, and that their lumen can be changed by stimulation applied directly or through the medium of the nerves. We are justified, therefore, in assuming that all vessels are under vasomotor influence. Such being the case, reflex action becomes a very important agent in the production of vessel dilatation in inflammation. Two other factors are to be mentioned as contributing to hyperemia: the loss of vessel tone due to direct paralysis of the muscular elements, and the diminution of extravascular tension before the development of large exudate. Both of these actions result from the local presence of toxins.

II. SLOWING OF THE BLOOD STREAM AND MARGINATION OF THE LEUCOCYTES.

Cohnheim,[7] the discoverer of diapedesis and one of the earliest investigators of the phenomena of inflammation,

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6. Steinach and Kahn: Arch. f. d. ges. Physiol., Bonn, xcvii, 105-133.

7. Cohnheim: Vorlesungen über allgemeine Pathologe, 2 Aufl., vol. 1.

observed that at first an acceleration of blood flow occurred, followed later by retardation. The arterial pressure and the vascular endothelium remaining unaltered, increase in the cross section of the vessel should result in acceleration of current; this, however, is soon neutralized by the action of other factors. Retardation has been explained in various ways: by increase of fibrin in the blood and by actual deposition of fibrin in the capillaries, by an attraction exercised on the blood by the surrounding tissue, which under the stimulus to hypertrophy requires more nutritive material, and by change in the endothelium of the vessel walls in the direction of greater viscosity. These theories are not easy of demonstration; that some sort of alteration occurs in the endothelium may be inferred from the subsequent act of diapedesis and secretion of fluid (since it is probable that the endothelium possesses a secretory function[8]). A change resulting from local toxic action must also be admitted. It can not be asserted positively that any alteration from these possible causes necessarily increases cell viscosity.

The margination of leucocytes is explicable, in part at least, by the law of hydrodynamics that the lighter bodies carried in a current seek the slower portions of the latter. The white corpuscles, of less specific gravity than the red, would drift to the periphery of the blood stream where the greatest retardation would occur. A second factor is to be found in chemotaxis, the physiologic property by virtue of which leucocytes are attracted or repelled by other substances. This action is exerted through the vessel wall and is due to the presence of an extravascular toxic agent. Leucocytic migration is independent of direct nerve influence.

III. DIAPEDESIS.

The leucocytes pass outward through the vessel walls as the result of several factors, the most vital of which

8. Sihler: Jour. Experim. Med., vol. 5, p. 493.

are: first, the inherent property of certain white corpuscles of ameboid movements, and, second, the reaction of the leucocytes to the chemotactic influence of an extravascular irritant. To these may be added: the *vis a tergo* of the blood stream and the change in the cells of the vessel walls; both of these factors are necessary for the passing outward of the red corpuscles. The alterations in the vessel tissue comprise a thinning of the intercellular cement substance and a widening of the stomata marking the points of contact of several cells. Through these stomata, serum, leucocytes and red corpuscles may be forced by pressure alone; the attenuation of the intercellular substance and the altered consistency of the endothelium probably facilitate the migratory act of the leucocytes. The fluid portion of the blood reaches the exterior of the vessels through the stomata, as already mentioned, by the physical act of osmosis and probably by secretory action of the endothelium. Local toxic influences may favor osmosis by producing alteration in the cells of the vessel walls and by disturbing the isotonic relation between vessel content and perivascular fluids. Any secretory power possessed by the endothelia must be under direct motor nerve control.

IV. PROLIFERATION OF FIXED TISSUE ELEMENTS.

The replacement of destroyed tissue is accomplished by proliferation of the fixed cells of the part. The stimulus to this activity is to be found in the increased nutrition of the portion involved, and in that innate property of cells which causes them to multiply when there is a demand for cellular increase.

V. SUMMARY OF NERVE INFLUENCES.

In summing up the influence which the nerves are thus shown to have in the evolutionary stages of inflammation it must be borne clearly in mind that we are now concerned with those impulses which occupy the distal portion of the reflex arc only; that is, those which are

motor in nature. From what has been said we are warranted in affirming:

1. The dilatation of the blood vessels is very largely the result of direct nerve action.

2. The slowing of the blood stream and margination of the leucocytes is related to direct nerve action only so far as a secretory impulse to the vessel endothelium changes their physical properties; that is, increases their adhesiveness.

3. Diapedesis of leucocytes is in no way dependent on direct nerve action; it is favored by conditions to the development of which nerve action has contributed. The pouring out of fluid from the vessels is probably due, in part at least, to direct nerve action.

4. Proliferation of fixed tissue elements is not the result of direct nerve action.

From this summary we may conclude that motor nerve impulse *per se* does not suffice to produce all the phenomena of inflammation.

VI. INFLUENCE OF SENSORY NERVES.

The question arises: What part in the production of inflammation is contributed by the sensory nerves, the proximal arm of the reflex arc? The function of a sensory nerve in this connection can be nothing other than to transmit to a center an impulse received at its peripheral termination. That impulse can be influenced by the nature of the irritant which produces it only as regards intensity, and it can impart to the motor impulse at the reflex center no other quality than that of intensity. The sensory impulse, therefore, while a necessary part of the reflex arc, influences the process of inflammation only as it prompts a mild or an energetic motor action beyond the receiving center. Combining this conclusion with the one previously made, we have the answer to our first question: The phenomena of inflammation can not be produced by reflex action alone.

VII. FACTOR SUPPLEMENTING NERVE INFLUENCE.

From what has been said it is patent that some factor must operate to supplement nerve influence in the pathogenesis of inflammation. This factor must furnish an effective cause for the development of those steps in the complex which are not the result of combined sensory and motor nerve stimulation. Of these steps the most important is the migration of leucocytes, and, as this migration is dependent on chemotaxis plus the ameboid properties of the cells themselves, the factor necessary must embody the further requirement of chemotaxis; that is, the power of attracting leucocytes. This embodiment is to be found in the presence locally of an irritant.

If we seek to define more specifically the nature of the irritation thus required, we will find that all types may be classified, according to source, under four headings, namely, chemical, mechanical, thermal, and actinic. If now we consider the exact manner in which the various forms of irritation accomplish their work as provocators of inflammation, we must admit that the first, chemical irritation, includes them all. It is a mooted question whether a substance acting in a purely mechanical way induces inflammation because of the difficulty of eliminating a coincident bacterial infection. It must be accepted, however, that the products developed from the degeneration and destruction of protoplasm are capable of acting as chemical irritants, and that in mechanical injury, even of slight degree, by a perfectly sterile agent, these products appear *in situ* with power to incite inflammation. The same statement holds with respect to the action of thermal and actinic agencies: the cellular degeneration and destruction which ensue result in the formation locally of substances, derivatives of protoplasm, which are inimical to the welfare of the unaffected tissue; hence inflammation occurs.

Given an area of skin within which a chemical irri-

tant acts and we have all the necessary elements for the development of a dermatitis; there is a stimulation of sensory nerves, reflex response in vessel dilatation and cellular secretion, migration of leucocytes to the site of irritation, development of an exudate, and, lastly, repair of tissue destroyed. We find in chemical irritation, therefore, the answer to the second question: It is the factor needed to induce and to supplement nerve action in the production of inflammation.

With respect to the pathogenesis of the various types of herpetic disease it may be said that the theory of the development of toxins at the site of lesion as the result of cellular disintegration has not been given the attention it merits. Granting that degenerative changes have been found in the spinal ganglia and in nerve trunks at considerable distance from the herpetic eruption: these can not directly produce the latter by conducting, as it were the pathologic condition inflammation from one part of a nerve to its terminations, leaving the intervening section of the nerve trunk intact. The more rational explanation is that these changes in nerve ganglia and trunk modify in some manner the normal trophic impulses, thereby leading to necrotic or necrobiotic alteration in the part innervated where, as suggested by Blaschko,[9] the products of disintegrating protoplasm alone suffice, without the help of secondary infection, to exert a local toxic action and to develop an inflammatory lesion.

SUMMARY.

To recapitulate:

1. The idea that nerve impulse alone can initiate inflammation is widespread in dermatology and forms the basis of the explanation of the pathogenesis in several conditions.

2. Reflex action is the form of nerve influence most frequently set forth as the originator of inflammation.

9. Blaschko: Mracek's Handb. d. Hautkrankh., vol. 1, art.:

3. A reflex requires for its production two kinds of nerve fiber, sensory and motor, a receiving center, and a stimulus applied at a sensory termination. The sensory impulse thus created is converted at the center into a motor impulse which, passing to the terminations of the motor fibers, causes the organ innervated to perform its function. Any nerve impulse to be directly effective in producing inflammation through reflex action must be motor in nature.

4. Inflammation is a complex which when complete presents the following stages in its development: Dilatation of the blood vessels, slowing of blood stream and margination of leucocytes, diapedesis of cellular and fluid constituents of the blood with formation of an exudate, and proliferation of fixed tissue elements.

5. Authorities differ in their conception of inflammation. In the broadest view taken, tissue proliferation is always present, migration of leucocytes usually is found, and vascular changes may occur. In the most restricted view, vascular phenomena must be present; in other words, all the stages enumerated must be found. Tissue proliferation and leucocytic migration, therefore, are common to all conceptions of the process.

6. Of the stages mentioned, direct motor impulse can produce: dilatation of the blood vessels and secretion of fluid by the endothelium. It is possible that it may influence indirectly the slowing of the blood stream, the margination of the leucocytes, and the readiness of passage of the latter through the vessel walls. Motor impulse has no direct relation to the migration of leucocytes and proliferative tissue changes, and hence is not sufficient to produce inflammation unaided and alone.

7. The factor necessary to supplement nerve action must embody the requirements of chemotaxis, the power of attracting leucocytes. This embodiment is found in external irritation.

8. The four sources of irritation, chemical, mechanical, thermal, and actinic, by analysis, may be narrowed

to one, namely, chemical. In chemical irritation reside all the essentials for the production of the full inflammation complex; it can initiate the requisite nerve action and can supply those factors which are necessary in addition thereto for the complete development of the process.

9. The products arising from the degeneration or destruction of protoplasm, whether from trauma, perversion of trophic nerve influence, or disturbance of cellular nutrition, may be toxic to living cells, and so furnish the chemical irritation requisite for the initiation of inflammation. This is probably the *modus operandi* in the various forms of herpes.

10. Finally, a purely reflex dermatitis is an impossibility, for the reason that every inflammatory skin lesion, because of the nature of the pathologic process involved, must have in its etiology the factor, local toxic irritation.

100 State Street.

A CASE OF PEMPHIGUS LIMITED TO THE MUCOUS MEMBRANES.

EDMUND L. COCKS, M.D.
NEW YORK CITY.

My object in presenting the history of a fatal case of pemphigus limited to the mucous membranes is to bring before you a case seen almost from its incipiency to a few days prior to the patient's death, a dermatosis so rare that its existence has been denied by a majority of dermatologists, Brock and Bernier claiming to have seen but four cases.

History.—Mrs. B., aged 37, a thin, nervous woman, the mother of five living children, was born at Pittsburg, Pa., of German parents. She had the usual diseases of childhood and developed into a strong, healthy woman. She married at the age of 24. Her health commenced to deteriorate after a miscarriage due to overlifting.

One year previous to the illness under consideration, Feb. 15, 1904, she experienced her first chill, which lasted two hours. Later in the day she menstruated. A year later she had a second chill lasting the same length of time. The following morning on account of the swollen condition of the tongue, she was unable to talk, and swallowed food with great pain and difficulty. Numerous pea-size vesicles were to be seen on the tongue, buccal mucous membrane, pharynx and lips. This condition persisted for two weeks, the older vesicles rupturing, swelling and subsiding. Deglutition became less painful.

The date of her next menstruation was ushered in by a severe chill, followed by a repetition of the first attack, which ran a like course. The third was similar to the two previous attacks, also the fourth, but the menses did not appear the following month.

Up to the seventh month of her pregnancy each was a duplicate of the previous month, the patient becoming more and

more discouraged and emaciated. The two weeks preceding the seventh month of her pregnancy she was very comfortable but, she painfully remarked, January 14 was a banner day. The chill lasted three hours, with a slight remission.

Examination.—I saw her the following day; there was not a pea-size space of tongue, lips, buccal mucous membrane, pharynx or nasopharynx that was not the site of vesicles. There were several vesicles on the conjunctivæ. In the vagina were several bullæ; cervix was free. The rectoscope revealed vesicles as far as could be seen.

Treatment.—Lancing the vesicles of the mouth and touching their bases with an aqueous solution of methylene blue, 20 grains to the ounce, gave the patient considerable relief. Those of the vagina and nasopharynx were not incised but ruptured within three or four days. Small painful ulcerations resulted which did not heal for several days. Although at no time during her pregnancy was she free, by opening the vesicles as soon as they appeared, a fair degree of comfort and health was maintained.

Her food consisted of milk, to which cream had been added, eggs and concentrated liquid food. She gained slightly in weight until the fatal attack. She was seen almost daily and arsenic was prescribed and pushed from the first. All known local remedies were tried but methylene blue gave the greatest relief.

Further History.—The eighth month was no exception to the rule. The ninth month was ushered in by a chill and in a few hours the patient's tongue was so swollen that at the height of her labor she could not cry out for pain, or laugh for joy at its termination. Two weeks after her confinement she commenced to gain rapidly and we were all hopeful, though I had given my opinion that the pregnancy was not an etiologic factor. This quiescent period lasted three months then a return of all the symptoms, persistent vomiting and uncontrollable diarrhea greatly aggravated the patient's condition and rapid emaciation and death followed in one week. At no time was there a cutaneous symptom of any kind.

Historical Report.—During the height of an attack the contents of a vesicle situated on the tongue were aseptically drawn into a pipette and proved to be sterile. The contents of a flabby vesicle or one several days old showed numerous staphylococci. The blood at this time showed a leucocytosis of about 10 per cent. Between the attacks the blood was normal. The urine, examined numerous times, showed nothing abnormal but indican, which was present in a greater or less quantity during her entire sickness.

Postmortem Findings 24 Hours After Death.—Vesicles occluded the nares, they were also present in great number in mouth, on tongue, pharynx and esophagus. The mucous membrane of the stomach was also affected, the intestinal track from pylorus to anus was involved. The vesicles of the intestines were flatter and in some places where they had ruptured, ulceration to the muscular coat had taken place.

There were a few disseminated vesicles on the serous surface of the liver, spleen, intestines and pleura.

This case seems to have been one of pemphigus limited to the mucous membranes, probably due to indican, the result of intestinal fermentation, for which her family physician had treated her for several years, her pregnancy having had little, if anything, to do with her condition, in spite of the fact that her symptoms were worse at her menstrual periods preceding her pregnancy and at the time she would have menstruated if not pregnant.

DISCUSSION.

DR. WILLIAM S. GOTTHEIL, New York City, said that in his clinical work, on the lower east side of New York City pemphigus is a comparatively common affection. There are always two or three such cases in the City Hospital, and the same is true of the Lebanon Hospital. In two patients recently under his care the lesions were restricted to the mouth for a long time. One of these patients had been referred to him as presenting a case of syphilis, and his own diagnosis at the time was mercurial stomatitis. It proved to be a case of pemphigus, affecting first the mouth and later the cutaneous surfaces, and finally proved fatal. Dr. Gottheil said that he has never seen pemphigus limited to the mucous and serous membranes end fatally, as in the case reported by Dr. Cocks.

DR. L. DUNCAN BULKLEY, New York City, said he could corroborate Dr. Gottheil's statement in regard to the frequency with which pemphigus occurs in certain sections of New York City, especially on the lower east side. At the New York Skin and Cancer Hospital, cases of this disease are comparatively common and they almost invariably come from that district.

LICHEN PLANUS OF THE ORAL MUCOSA.

WITH REPORT OF TWO CASES.

DAVID LIEBERTHAL, M.D.

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CHICAGO.

In his work on "Differentialdiagnose von Dermatosen und Lues bei den Schleimhauterkrankungen der Mundhoehle, etc.," Trautmann gives a carefully prepared review of the 72 cases of lichen planus of the mucous membranes published up to 1903. There are other cases mentioned in literature, but very briefly. Considering the comparatively frequent occurrence of lichen planus of the skin, the localization of the process on the mucous membranes is rather rare, and it is interesting to note that this subject is rarely and only recently touched on in American literature. Among the cases cited by Trautmann none is from an American author. The importance of this affection is evidenced by the fact that it may easily be confounded with syphilis. There are cases of lichen planus which have a distribution limited to the palms of the hands or to the soles of the feet, or to the penis or to the scrotum, or to two, three or all of these localities which may show some resemblance to syphilitic manifestations. In some cases painless swelling of lymphatic glands is noted. Now if besides such cutaneous lesions and swelling of glands symptoms of lichen planus occur on the mucous membranes of the oral cavity, throat and lips, how easily may a misinterpretation take place and lead to most embarrassing situations.

DESCRIPTION OF DISEASE.

Lichen planus affects most frequently the mouth, rarer the anus and urethra, rarest the larynx. It begins either contemporaneously with the lesions on the skin or it may precede or follow them. In a number of cases the mucous manifestations are the only symptoms of the disease, in which instance, a mistake in the diagnosis may also be easily made. Just as the eruption of the skin is characterized by the development of typical papules from which other pictures are derived, so are the lesions of the mucous membranes resultant from elementary lesions, papules of which show quite different characters from those of the papules of the skin. The elementary lesion of the mucosa presents a punctate to pinhead size, rarely larger, white and glossy or grayish-white and dull (the latter if situated on the tongue) elevation, with a flat, hemispherical or conical top and a roundish or polygonal basis which as a rule is sharply defined, i. e., surrounded by perfectly normal mucous membrane. It is hard and rough to the touch and causes no subjective symptoms. Such papules rarely remain solitary but coalesce and present various lesions, which show their origin from papules if in a recent stage of development.

On the cheeks, lichen planus as a rule affects that part which is just opposite the interdental space and presents papules, oval or circular plaques and most frequently streaks or linear projections with intervening furrows. These projections are arranged in different ways, parallel to each other, convergent or divergent, crossing each other in different directions and forming networks or stellar or brush-like formations. They all show the characters of the elementary papules. In other words, they are opaline, sharply defined and painless.

The lesions of the tongue differ somewhat. On the back, they present irregular, oval or circular plaques, while on the upper and lower surfaces of the margins solitary papules are found or, more frequently, irregular

or band and streak-like plaques. All these differ from the lesions of the cheeks. They are as a rule not sharply defined. They are smooth, less hard, not raised above the level of the normal surface, not glossy, but dull and grayish-white. On the mucous membrane of the lips, the papules form irregular plaques and on the vermilion border groups or irregular plaques.

On the soft and hard palates and on the gums, solitary and aggregated papules are more frequent than plaques or networks. On the tonsils the more solitary lesion prevails. As mentioned, the older the process of the mucosa becomes, the more do the papules coalesce and lose their distinct outlines until the elementary lesions can not be recognized as such. The plaques and streaks lose to a great extent their roughness and hardness and at last they become so flat that there is no elevation present, but only the shiny white discoloration resembling a mucosa touched with silver nitrate (Thibierge).[1] These lesions show no tendency to degenerative changes; no erosion or ulceration occurs. The anatomy is similar to that of the lesions of the skin.

DIFFERENTIAL DIAGNOSIS.

Some difficulties are encountered in the differentiation between lichen, leukoplakia proper and syphilitic lesions. It can not be denied that there are striking similarities between the first two, but a number of points may be observed showing a difference. In leucoplakia the patient, as a rule, will consult the physician on account of subjective symptoms, of dryness, stiffness, more or less pain at the ingestion of hot or very cold liquids or spicy substances, while in lichen planus the lesions of the cheeks are rarely noticed by the patient and then only in rare instances when the tongue touching them perceives slight roughness, while those of the tongue may be felt as a slight stiffness in mastication. Leucoplakia never heals without local interference, while lichen

1. Annal. Derm. and Syph., 1885, p. 65.

planus may heal spontaneously or disappear by the administration of arsenic, while the cases calling for local treatment are in the minority.

The changes observed on inspection differ materially from those of lichen planus. Papular formations are rarely encountered and if plaques present themselves, they are, as a rule, thickened and hardened. If on the cheeks and of a recent stage of development, they affect in many instances the mucosa behind the angle of the mouth, while lichen frequently first develops on the posterior portion. If left untreated, leucoplakia shows

Fig. 1.—Lichen planus of the dorsa of the hands.

the tendency to increase in thickness with time, to become rough, rugged, and even exfoliating, while lichen planus becomes flatter and smoother continuously until at last it is level with the mucosa and represents only a discoloration such as is produced by the application of silver nitrate. This latter appearance is noted also in recurring lichen planus. In lichen planus the papillæ of the tongue are flattened while in leucoplakia they may be accentuated. Leucoplakia is infrequent in women while lichen planus is equally frequent in both sexes. At this juncture I call attention to the excellent

editorial of Dr. J. N. Hyde,[2] "Lichen Planus and Leucoplasia of Mucous Surfaces."

The differential points between syphilis and lichen planus of the mucosa are: Syphilitic lesions of the mouth are painful (except plaques of the tonsils which in spite of their extensive development sometimes may be painless), lichen eruptions are painless. The syphilitic mucous plaques are situated within a highly reddened infiltrated area, lichen planus is surrounded by perfectly normal mucosa. The syphilitic manifestations show a tendency to progressive changes, viz., erosion, ulceration and proliferation; lichen planus, though also quite persistent—lasting sometimes for months—shows no such changes. These, together with the characteristics of lichen planus previously described may serve to differentiate these processes. In addition to these, the cutaneous lesions—if present and typical—and also the effect of specific treatment, will aid the practitioner to establish a diagnosis.

TREATMENT.

As regards the treatment, we must repeat what has been already mentioned, viz., that lichen planus will at times heal spontaneously. Some cases yield promptly to the administration of arsenic, the mucous lesions healing as readily as those on the skin. In other cases the mucosa heals later, while some do not even yield to arsenic nor any other systemic treatment. Touton[3] recommends highly the local application of a 1 per cent. solution of bichlorid in alcohol. It is well to prevent all irritation from sharp substances and to instruct the patient as to all necessary hygienic care of the mouth. I am indebted to Trautmann's book for many details which are contained therein as collected from the literature of this subject.

2. Jour. Cut. Dis., incl. Syph., 1903, p. 105.
3. Berlin. klin. Wochschr., 1886, No. 23.

CASE REPORTS.

I wish now to describe the cases which have come under my observation. The patient in Case 1, already reported,[4] was afflicted with lichen planus hypertrophicus, on whose buccal mucosa were found two typical planus papules in the course of his disease.

CASE 2.—Patient, aged 21, male, came under my observation in January, 1903.

History.—Family history was negative as to skin affections or syphilis. Outside of diseases of childhood he had passed through no serious illness. For the last four or five years he had used tobacco immoderately. He consulted me for a gonorrheal infection of the urethra and bladder.

Fig. 2.—Lichen planus of the lip.

Examination.—Examination also revealed tuberculosis of the apices of both lungs. The blood showed hemoglobin 75 per cent., red corpuscles a little over 4,000,000, leucocytes, 8,000. No other abnormal conditions were found except the affection of the skin and oral cavity which I detected at the examination. The manifestations of lichen planus were limited to the forearms, abdomen, penis, scrotum and buccal mucosa. On the lower surface of the penis and on the left side of the scrotum typical flat polygonal pinhead to pea-sized papules were noted, which were mostly arranged in ringed formations, and plaques up to the size of a dime with polygonal borders and all the other characteristics of the papules. They were dense, yellowish-

4. THE JOURNAL A. M. A., Jan. 11, 1902.

red and of waxy appearance. On the flexor surfaces of the distal ends of the forearms were about half a dozen lesions, and below the umbilicus a group of five papules. All these showed the same characteristics as the lesions on the scrotum and penis and were not larger than a split pea. The cutaneous eruption caused no inconvenience and he noticed it only at the time of infection with gonorrhea, one month before his first visit to my office. He denied noticing any sensations in the mouth. On inspection, I found on the posterior part of the mucous surface of both cheeks, opposite the interdental space white, glossy linear elevations, forming an irregular network and anteriorly to these a number of pinpoint to pinhead-size flat papules. The streaks forming the networks showed clearly their derivation from solitary papules and all the typical symptoms as previously described. They were hard and rough to the touch. No other parts of the mucous membrane were affected with lichen, but a pharyngitis sicca was present. The inguinal glands were slightly enlarged and painless, as also the cervical and submaxillary.

For various reasons I deferred the treatment of his lichen planus. The lesions of the skin did not increase in number nor in size, but, on the contrary, they gradually faded, until in April of the same year all had disappeared. The patient was under my care for three more months when he was discharged. At that time the mucous surface was as free from lesions as the skin, although no treatment had been employed.

Further Examination.—In April, 1906, he called on me for treatment of scabies. I interrogated him as to whether he had noticed any lesions in the mouth or on the skin during the last three years, but he had paid no attention to the matter. Besides the symptoms of scabies, I found the following: The penis and scrotum were free from lichen though the leucodermatic spots were still present and of the same size as three years ago, but now with a hyperpigmented area. An irregular leucodermatic spot was also seen on the radial side of the left forearm, the former seat of lichen lesions. There were four lichen lesions of pinhead to split-pea size on the flexor surface of the distal end of the right forearm, and three pinhead size on the corresponding part of the left forearm. On the lower part of the back, to the left of the spinal column, were three papules of pinhead size. All these papules were yellow and waxy.

On the left margin of the tongue were two plaques, one of the size of a pea, the other of a bean, and between these a dull, white streak. On the buccal mucosa of both sides were irreg-

ular plaques reaching up to the soft palate. On the gum of the lower jaw on both sides, around the molars, white streaks and irregular plaques were noted and on the uvula an irregular white spot. All of the last described lesions of the mouth were perfectly smooth, not elevated, opaline, most of them resembling a mucosa touched with silver nitrate.

At the April meeting of the Chicago Dermatological Society (1903), I demonstrated the patient at which

Fig. 3.—Microscopic section of lichen planus. Low power.

time the mucous lesions were still present, but the cutaneous surface was completely free except that those parts of the penis and scrotum which had previously been the seat of lesions, showed a total absence of pigment. In other words, there was a leucoderma or vitiligo, which differed from its normal appearance by the

absence of the hyperpigmented zone. This case bears a striking resemblance to the cases of Pincus[5] and Danlos.[6]

CASE 3.—A girl, aged 18, consulted me for her ailment about the time I cared for Case 2. She was chiefly annoyed by the appearance of her hands and lower lip.

History.—In her family history I elicited nothing bearing on her case nor had she had any previous skin affection or other serious illness. She had always enjoyed good health. Her present condition dated back a month or two, beginning first on her hand and subsequently affecting her lip. She complained of itching of the scalp.

Examination.—Examination of the internal organs and urine was negative. The blood showed a decrease in hemoglobin to 70 per cent. The scalp revealed the presence of excoriations due to pediculosis. On the nape of the neck were excoriations and livid flat elevations varying in size from a pinhead to that of a bean. They showed the typical characteristics of lichen, some of them closely representing the former seat of excoriations. They were all irregular in outline and had a rather rough surface. The nuchal and cervical glands were enlarged and slightly painful. On the dorsum of the right hand were about 25 polygonal lesions, pinhead to pea size, of a pale yellowish-red color, flat, smooth and shiny, the larger ones showing distinctly their derivation from the coalescence of smaller papules (Fig. 1). Besides, in the larger ones, there was a perfect depression reaching to the level of the normal skin, the color of this central portion being yellowish-brown (Lichen annularis). In the right inguinal region there was a group of about ten papules of the same appearance as those on the dorsum of the right hand but without a central depression. On the dorsum of the left hand were a few typical papules, pinpoint to pinhead size. No other part of the cutaneous surface was affected.

The vermilion border of the lower lip showed a copious eruption consisting of groups of pinpoint to pinhead size opaque, white, polygonal and round papules, sharply defined and irregular as well as roundish white opaque plaques of various sizes, some of the round ones having a depressed center (Fig. 2). The margins of all these lesions were slightly raised

5. Dermat. Ztschr., 1903, p. 169.

6. Annal. Derm. and Syph., 1904, p. 486. See also the articles of Riecke on "Lichen Planus," Mracek's Handbuch der Hautkrankheiten, 1905.

above the level of the normal portions of the vermilion border, of which there was not much left unaffected. They felt dry and rough to the touch. On the upper and lateral surface of the left margin of the tongue and the lower surface of the right margin there were grayish-white, irregular and streak-like

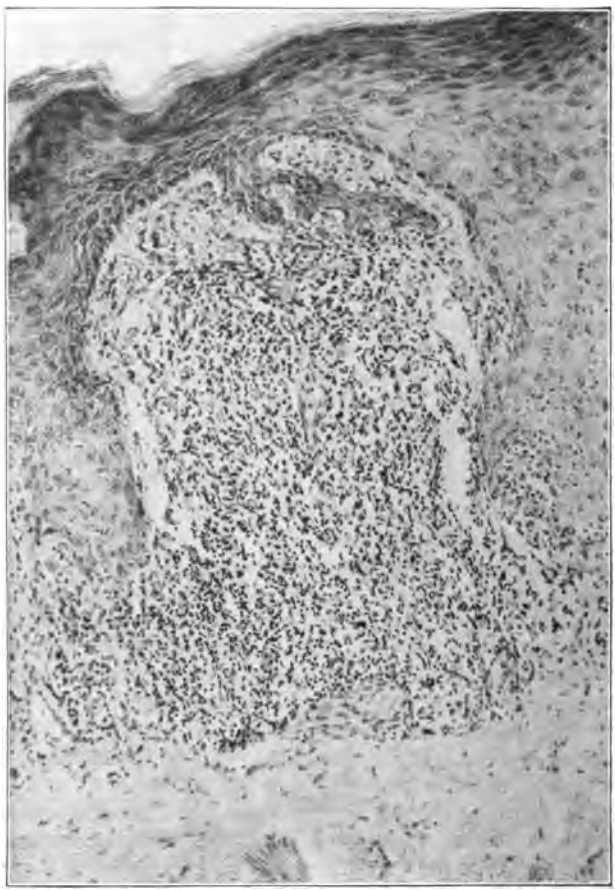

Fig. 4.—Microscopic section of lichen planus. High power.

smooth plaques not sharply defined. On the back of the tongue in its posterior half were three slate-colored plaques arranged asymmetrically in the raphe in close proximity one behind another. Their size was about that of a dime, their

surface smooth and dull and lacking the distinct papillæ. Their consistence was not different from that of the surrounding normal mucosa. They were not raised. There was no hyperemia or infiltration zone around them. They were round and did not show any trace of their origin from typical mucous papules, while on the borders of the tongue and the vermilion border of the lower lip there were true papules and papular indications in the periphery of the plaques. The clinical symptoms justified the diagnosis of lichen planus.

Patient objected to an excision from the lip or tongue but a piece was excised from a larger lesion of the dorsum of the right hand. It was fixed in Zenker's solution. The paraffin sections were stained in hematoxylin and eosin, Unna's alkaline methylene blue, eosin and carmine and Weigert for elastic fiber.

Microscopic Examination.—(Figs. 3 and 4.) The epidermis as a whole is thickened. The horny layer consists of horny wavy lamellæ and is loosely attached. It is thickened and does not show any nuclei. The granular layer is in places thickened. The stratum spinosum is also thickened and shows widened intercellular spaces especially in its lower portion. Some of the cells show vacuoles and between the lower rows of cells round infiltration cells penetrate from the papillary layer. The pigment is not increased. The epithelial projections are broadened and elongated. The papillæ between these enlarged pegs are also hypertrophied and show a dense infiltration of small round cells which show a tendency to arrangement along the dilated blood and lymph vessels. Typical plasma cells or plasma mast-cells were not found. The subpapillary layer shows the same dense infiltration and beneath this all infiltration ceases abruptly. The reticular layer of the corium is perfectly normal excepting here and there a few rows of cells around blood vessels. The networks of elastic fibers are normal. Follicles and sebaceous glands were not found. Around the lichenoid structure the skin were perfectly normal (Figs. 3 and 4).

Treatment.—This consisted in the administration of pills of reduced iron, arsenious acid in increasing doses and a regulated diet. No local applications were made. The lesions of the skin and of the mucosa showed decided improvement after about three weeks when the patient disappeared from my care.

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DISCUSSION.

DR. L. DUNCAN BULKLEY, New York City, said that a few years ago lichen planus was described as an affection which was confined to certain areas, especially the hands and wrists. More recently, a further study of the subject has shown that the eruption may involve all parts of the body. Dr. Bulkley said he believes that he was the first to describe two cases in which the affection was observed on the glans penis before involving any other part of the body. The lesions in those cases were characteristic, and had existed for some months before the patients sought treatment. Lesions finally developed elsewhere on the body, and there could be no mistake in regard to the diagnosis. He has since seen a number of similar cases. Occasionally he has observed the lesions on the tongue and inside of the mouth, as well as on other mucous surfaces. Dr. Bulkley said that arsenic is one of the most valuable remedies to control the lesions of lichen planus, provided it is taken in full doses and continued for a sufficiently long time. How the drug acts is not known, but it certainly has some controlling influence over the development of the lesions. The fact should be borne in mind, however, that every case of lichen planus does not improve with the use of arsenic, and in some instances it even aggravates the affection. Cases have to be treated more or less along general lines. He called attention to a method of treatment introduced thirty years ago or more by the elder Dr. Boeck of Norway, who regarded lichen planus as a disease of suboxidation, and on empirical grounds suggested the use of chlorate of potash in from 5 to 10 grain doses, taken directly after meals, and followed in the course of half an hour with 5 or 6 drops of strong nitric acid, well diluted. Dr. Bulkley said that he is strongly convinced of the value of this treatment, and has resorted to it in many cases with the greatest degree of success. Later in the course of the disease it may be necessary to give arsenic, or the arsenic can be alternated with the chlorate of potash and nitric acid.

DR. JAMES C. WHITE, Boston, asked Dr. Lieberthal if he had noticed whether the lesions in the mouth showed any tendency to maceration.

DR. HENRY G. PIFFARD, New York City, said that the chlorate of potash and nitric acid treatment of lichen planus, to which Dr. Bulkley referred, was introduced about 25 or 30 years ago by Dr. Robert W. Taylor (*Archives of Dermatology*, January, 1875).

DR. DAVID LIEBERTHAL, Chicago, said that it was a well-known fact that acute lichen planus will not heal under the use of arsenic. Besides other cutaneous symptoms, arsenic produces hyperemia and exudation, especially in places which are the seat of pathologic changes. Therefore, it not only

does not beneficially influence acute lichen, but, on the contrary, sometimes acts unfavorably. Dr. Lieberthal said that he would regard acute lichen planus as an acute dermatitis, and treat it accordingly. In reply to Dr. White's question, he said that there was no maceration, in the strict sense of the word, in any of the lesions. The lesions on the cheek at a certain stage were somewhat flattened, and looked as if they might be the seat of some maceration.

MYOMATA CUTIS.

M. L. HEIDINGSFELD, M.D.
CINCINNATI.

Reduplication of the involuntary muscular fibers of the skin to the degree of tumor formation is probably one of the rarest conditions encountered in dermatology, if the limited number of accepted cases thus far reported in the literature is duly considered. It is more rarely encountered if Besnier's[1] commonly accepted classification is observed and those cases which primarily spring from subcutaneous muscular tissue, the dartos, labia, mamma, etc., the so-called dartoic myomata, which are essentially of surgical importance, are properly excluded. Radcliffe Crocker[2] states that his case is the eleventh clearly defined instance in the literature and accords value to the two additional cases of Wolters'[3] doubtful classification. Leslie Roberts[4] asserts in 1900 that his additional case constitutes the fifteenth well defined instance. There have been but few cases reported in recent years, and Huldschinsky[5] maintains that his constitutes the sixteenth additional case.

A casual survey of the literature reveals a somewhat larger number of cases of myoma cutis, than some of these reports indicate, and this disparity exists because many cases are not credited recognition, since they lack certain clinical characteristics. Myomata cutis present exceedingly varied clinical manifestations, but a fairly

1. Ann. de Derm., 1880, p. 25; also p. 332.
2. Brit. Jour. Derm., 1897, pp. 1 to 48.
3. Wolters: Arch. f. Derm. u. Syph., 1893, xxv, p. 414.
4. Brit. Jour. Derm., 1900, xii, p. 116.
5. Inaug. Diss., 1901.

uniform, easily recognized, and somewhat characteristic histopathology.

In cutaneous affections it is essential to show a fair degree of consideration to the clinical aspects; it is equally important to give proper attention to the histopathology. It seems particularly unjust and unwarrantable, to ignore entirely the stable and easily recognized histopathology in behalf of a varied and indeterminate clinical character.

REVIEW OF LITERATURE.

The clinical characteristics as already stated are exceedingly varied. The lesions are single or multiple, congenital or acquired. Single lesions are reported by Förster,[6] Sokolow,[7] Axel-Key,[8] Audry,[9] Santesson,[10] Miglionini,[11] Herzog,[12] etc., and are generally excluded from general recognition. The multiple cases vary from a few to sixty or more as in the case of Lukasiewicz,[13] 100 or more as in Marshalko's[14] case or innumerable as in the cases of Verneuil[15] and Besnier.[1] Some develop in earliest infancy (Hess,[16] Jarisch[17]), the majority during adolescence, and not a few in advanced age. Unna,[18] Darier, Krzysztalowicz[19] and a few other observers attribute a congenital character to the affection, and hold it an additional confirmation of Cohnhein's theory of embryonic remains, puberty, stimulating the developmentally misplaced tissue to renewed activity. Wolters'[20] third case, which occurred over a meningocele and

6. Wien. med. Wochschr., 1858, p. 130.
7. Virchow's Archives, 1873, lviii, p. 316. Quoted by Neumann.
8. Quoted by Neumann.
9. Ann. de Derm. et de Syph., 1898, ix, p. 182.
10. Quoted by Neumann.
11. Giorn ital. delle Mal. Ven. e della pelle, No. 1, 1905; abst. N.P.D., vol. xl, p. 610.
12. Jour. Cut. Dis., 1898, xvi, p. 527.
13. Arch. f. Derm. u. Syph., xxxiv, 1892, p. 33.
14. Monatschr. f. prakt. Derm., 1900, xxxi, p. 317.
15. Soc. Anat., 1858.
16. Virchow's Archives, 1890, cxx, p. 321.
17. Deutsch. Derm., Gesell., 1895, v, p. 360.
18. Histopathologic der Haut., p. 863.
19. Monatbl. f. prakt. Derm., 1906, xlii, p. 303.
20. Derm. Ztschr., No. 7, 1905.

Dore's[21] case in a man of 29, whose father was also afflicted with the same condition, are important contributions to the congenital origin of at least some of the cases.

In a number of cases the lesions manifested themselves late in life, and were of short duration. Whitfield[22] reports a case in a man 47 years of age, of five to six years' duration. Graham Little's[23] case occurred

Fig. 1.—Case 1. Incipient growth of myomatous tissue, in proximity to their hair follicle and corresponding to the site of its arrector pili, from which it has probably taken its origin.

in a middle-aged woman and was scarcely of six months' duration. In White's[24] case the first lesion occurred four years prior in a man aged 45 years. A traumatic origin has been attributed to a few of the cases. Jadas-

21. Brit. Jour. Derm., 1902, p. 55.
22. Brit. Jour. Derm., xvii, p. 267.
23. Derm. Soc., London, June 14, 1905; also Brit. Jour. Derm., xvii, p. 265.
24. Jour. Cut. Dis., 1899, xvii, p. 266.

sohn's[25] second case, in a female aged 37, followed vaccination. Brigidi and Maracacci's[26] case in a man aged 54, was preceded by swelling of the dorsum of the right hand without cause, which was followed in three months with the appearance of the nodules, and deep wine stains of telangiectasis. This was followed in eighteen months by the formation of similar lesions on the left hand and feet. Whitfield's[22] case followed an eruption of blisters. The lesions vary in size from a millet seed to a hazel nut, or larger, and are distributed as a rule over limited areas, a portion of the trunk or face, or one of the extremities with no special area of predilection. The color of the lesions varies from red, brown, yellow, blue, purple dark-colored to translucent or colorless. Many are accompanied with marked dilatation of the superficial capillaries and veins of the immediate neighborhood, of sufficient degree to mask the clinical appearance of the myomatous lesions so that the first diagnosis is often that of angioma, or cavernous angioma; for this reason Neumann[27] divides myomata into two classes, (1) pure myomata, tumors of involuntary muscular tissue with a small amount of fibrous and elastic tissue, and (2) cavernous myomata, which are also rich in vascular tissue and cavernous spaces. For the same reason Virchow[28] classes the affection with the erectile tumors under the head of myoma telangiectodes. Severe paroxysmal pain, sharp lancinating, vice-like in nature which may occur spontaneously at any period of the twenty-four hours, or be induced by physical exertion, temperature changes, or local pressure, is present in somewhat over one-half the cases. It is commonly regarded an important diagnostic symptom, but is entirely absent in a large per cent. of the cases. It occurs for

25. Virchow's Archives, 1890, 71, p. 88.
26. Imparziale, 1881. Quoted by Neumann.
27. Arch. f. Derm. u. Syph., xxxix, p. 3; Ann. de Derm. et Syph., 1897, p. 93.
28. Virchow's Archives, 1854, pp. 553-554, Die Krankhaften Geschwülste, vi.

the most part in the larger and longer standing lesions, and is explained on the basis of pressure of the muscular tissue on included nerves. Joseph[29] regards it as merely a coincident, without possessing special clinical significance.

The clinical features therefore are of such a varied and indefinite character that the diagnosis is a matter of conjecture in the most favored instances, and generally requires histologic confirmation to merit unquali-

Fig. 2.—Case 1. Interlacing bundles of myomatous tissue and inflammatory exudate, taken from the center of the growth.

fied acceptance. In many of the cases the diagnosis was not made until the microscopic examination was completed, which resulted in not a few instances in a change from xanthoma, lymphangioma, epithelioma, keloid, adenoma sebaceum, etc., to myoma.

Herzog's[12] diagnosis was based purely on the histo-

29. "Gutartige Neubildungen," Mracek's Handb., 1904.

logic examination, the single slowly growing, rather painful lesion on the cheek, which was about two-fifths of an inch in diameter, was previously diagnosed epithelioma, and excised for histologic examination. The prehistologic diagnosis in Krzysztalowicz's[19] case was adenoma sebaceum, with lesions on the ala, and septum of the nose and lip. The cases of Babes,[30] Brigidi and Maracacci[26] are probably derived from nevi and are generally discredited (Unna[19]). The material from Vernieuil's[15] case came from the dissecting room. The lesions in Whitfield's[22] case were so translucent that a lymphangioma was suspected, until fluid failed to exude on puncture, and the biopsy established the myomatous character of the lesion. Neumann[27] remarks the clinical resemblance of his case to xanthoma tuberosum, or urticaria papulosa. Wolters'[20] second case bore a deceptive clinical resemblance to xanthoma diabeticorum, and he states that a case of Crocker's,[2] reported as xanthoma may be rather a case multiple myoma. If the clinical features, neither in point of form, color, consistence, derivation, spontaneous paroxysmal and pressure pain, are not constant enough in themselves to assure a diagnosis, the biopsy, as Max Joseph[29] correctly states, will readily determine the character of the affection; and reduplication of involuntary muscular tissue to the degree of tumor formation, having its origin and development in the skin must be classed myomata cutis, irrespective of its congenital or acquired nature, its traumatic or idiopathic origin, its red, brown, yellow, pink, purplish, translucent or normal skin color, its soft, firm, or elastic consistence, its indolent or painful nature, associated or unassociated telangicctases, multiplicity, distribution, growth and development.

CASE REPORTS.

CASE 1.—*History.*—Nov. 18, 1904, J. R., tailor, aged 36, presented himself for a painful lesion over the left knee the size

30. Wien. med. Wochschr., 1856, p. 130.

of a silver quarter. It followed a fall from a bicycle, which the patient received 9 years ago while trying simultaneously to avoid a wagon and a street car coming in opposite directions. He was thrown violently against the wagon and sustained a severe contusion of the left knee. The injured area was covered with an ecchymosis the size of a silver dollar, and accompanied with extensive swelling, confining the patient to his bed for five days and inducing partial disability for almost a subsequent week. The ecchymosis underwent the characteristic changes from red to purple and brown, and the adjacent swell-

Fig. 3.—Case 1. Myomatous tissue and inflammatory exudate, containing cavernous dilated blood vessels in the superficial portion of the growth.

ing disappeared. The central area, however, gradually took on a bluish red discoloration, and in the course of 6 months or a year became enlarged and painful, presenting as nearly as patient can determine its present characteristics.

Examination.—Over the external tuberosity of the tibia there was an irregular elliptical area about the size of a silver quarter, bluish red in color, and covered with four or five soft, easily compressible swellings, which presented all the clinical

features of tortuous, dilated, superficial veins, and from their appearance prompted the diagnosis of a cavernous angioma of the skin. Closer examination also revealed five or six small, rounded, slightly elevated, smooth, glistening nodules, yellowish brown in color, varying from pinhead to a split pea. Patient stated that the lesion was the site of severe paroxysmal, lancinating pain, which was easily induced by pressure, but was often spontaneous and induced by such slight causes as the pressure of the undergarments or trouser leg. The excruciating character of the pain induced the patient to seek attention, and the lesion was promptly excised under cocain anesthesia. The pains persisted for a short period after the excision, but gradually disappeared, and there has been no recurrence, either of the tumor or pain after an interval of over one year.

Histologic Examination.—The growth was sectioned in serials and revealed two distinct types of pathologic change. Some of the areas presented dense masses of interwoven bundles of involuntary muscular fibers, distributed for the most part in the superficial layer of the cutis, extending to the epidermis, invading the papillæ and entirely obliterating the latter over large areas by pressure atrophy. The nuclei of these muscular bundles preserved their characteristic rod shape appearance and were cut variously longitudinally, crosswise and obliquely in accordance with the interlaced distribution of the respective bundles. They were imbedded in finely fibrillated protoplasm, with no demarcation between the various cells. The general direction of the bundles was for the most part parallel to the surface of the skin. In the apparently older, denser and more central areas, they had replaced all other structures, save a few well-preserved capillaries, with a moderate amount of endothelial proliferation and perivascular inflammation, and lymph spaces which were widely distended and extensively surrounded with mononuclear lymphocytes. The muscular tissue was free from elastic fibers which were well preserved and abundantly present in the surrounding tissue as far as the confines of the tumor masses (Figs. 1 and 2).

Elsewhere in the deeper layers of the corium were areas which consisted of closely aggregated vessels, with their widely distended lumina surrounded by thin walls, filled with circulating blood, or walls thickened with extensive endothelial proliferation, having the character of well preserved mononuclear lymphocytes, until the lumen was partially or completely occluded. These intensely vascular areas, which had the appearance of pure venous angio-cavernous tissue, were also free

from elastic fibers, and often merged with the masses of involuntary muscular tissue (Figs. 3-5).

Hair follicles were here and there well preserved in the muscular masses; sweat glands were well preserved, but there was no evidence of sebaceous glands. In the more normal appearing outlying areas of the specimen were numerous hair follicles, which on careful examination revealed arrectors pili in various stages of hypertrophy from a single thickened club shape strand to lobulated masses. Some of the tumor masses of muscular tissue could also be readily traced to the arrectors

Fig. 4.—Case 1. Vascular meshwork of dilated veins, partially occluded with inflammatory exudate; some completely, others incompletely filled with blood; taken from the deeper layers of the growth.

of hair follicles, which made it evident that they were the origin. This was further confirmed by the normal appearance of the muscular coats of the blood vessels and the absence of any direct connection, as nearly as could be discerned between the muscularis vasorum and the tumor mass. There was no well defined muscular net around the free lying sweat glands, and the entire absence of sebaceous glands served to render these structures an improbable origin. The only additional

pathologic change was a moderate amount of inflammatory infiltration between the muscular cells in limited areas of the tumor mass, consisting chiefly of the mononuclear lymphocytes and epithelioid cells.

CASE 2.—*History.*—H. C., aged 10, presented herself March 12, 1900, with a nevus situated over the left portion of the forehead, face, neck and left ear and encroaching to the median line anteriorly on the neck. It was present from birth and had undergone no material change.

Examination.—The lesions on the forehead were linear in form and grouped closely together into a yellowish, slightly elevated patch about the size of a postage stamp. The remainder consisted of rounded macules and papules, varying in size from a pinhead to a split pea. Some were elevated, rounded and glistening, yellowish and reddish brown in color, others darkly pigmented, firm in character and insensitive to touch. Some were soft, purplish or red in color and telangiectic in character. The remainder were flat and appeared to be pigmented macules, varying from black to light brown in color. The clinical diagnosis was nevus linearis. Pain was constantly absent. On June 23, 1904, patient was seen the second time and the lesions had multiplied enormously in point of number, extending over the left shoulder and down the chest as far as the nipple. The appearance and character of the lesions remained the same. Pain was constantly absent.

Histologic Examination.—The lesion on the forehead was shown to be essentially an adenoma of the sebaceous glands. The smaller lesions, when examined histologically, revealed a great variety of pathologic change. The linear, yellowish, elevated lesions on the forehead bore the structure of an adenoma of the sebaceous flands. Pigmented lesions showed a vast amount of pigment in the lower layers of the rete and cells pregnant with same, in the stratum papillaris and a general structure similar to the common pigmented mole, with which it bore a deceptive clinical resemblance. Others showed larger masses of fibro-connective tissue in the corium, similar in structure and appearance to that of a true keloid. Others, the sarcomatous appearance that is not uncommonly encountered in the ordinary pigmented mole. A few lesions which were clinically somewhat warty in appearance bore the structure of a papilloma. The lesions which were clinically small rounded firm, slightly elevated, reddish brown in color, and telangiectic in appearance, showed histologically dense masses of interwoven bundles of involuntary muscular fibers, distributed for the most part in the papillary portion of the cutis. The elongated nuclei,

with rounded extremities were abundantly present and characteristic in appearance and imbedded in faintly-fibrillated cellular substance, which was moderately infiltrated with lymphocytes. The masses of muscular tissue were well supplied with small vessels, with rather thick muscular coats; the muscular tissue seemed to be distributed for the most part around the larger vessels, and a direct connection was apparently evident at some points, which permitted the origin of the muscular tumor to be attributed to the muscularis vasorum. Elastic fibers were well conserved around the mass of involuntary muscular tissue and extended themselves in well-defined septa

Fig. 5.—Case 1. Two large, thin-walled cavernous vessels, partially filled with blood and surrounded with inflammatory exudate; taken from the deeper layers of the growth.

between the interwoven muscular bundles; well preserved hair follicles were present in normal number and appearance and apparently did not share the muscular hypertrophy. The arrectors pili were not in evidence. Remnants of sebaceous glands were conserved in close proximity of the hair. Sweat glands were absent, and the only remaining pathologic change of any note was a moderate dilatation of a few deeper vessels of the cutis (Figs. 6 and 7).

These cases present the following clinical and pathologic characteristics: The chief clinical feature of Case 1, characteristic of myomata cutis, are the paroxysmal pain, which at times was spontaneous, at times induced by insignificant physical agencies: the yellowish red color, firm character, and rounded appearance of the myomatous lesions. The bluish red dilatation of the cutaneous vessels, which induced the pre-biopsical diagnosis of cavernous angioma, possesses some degree of confirmatory value, inasmuch as it is reported to accompany a considerable number of the cases thus far recorded. The unusual clinical features are the predisposing trauma; the localization of the lesions to a comparatively small area, without evidencing much tendency to multiply in number or increase in size. In Case 2 the individual lesions bear a clinical resemblance, in size, color and form, to most of the cases currently reported, and were multiplied materially in number; some of the lesions also showed characteristic telangiectases. Unquestionably, from a purely clinical standpoint, it can be grouped with the linear nevi, as evidenced by the clinical appearance, and the histopathology of a large majority of the lesions. The entire absence of pain also militated against the clinical diagnosis of myoma. Its early development and congenital nature can be regarded as evidence for as well as against its myomatous nature.

From a purely pathologic standpoint both cases were unquestionably myomata cutis. Both showed interlacing bundles of involuntary muscular fibers, situated for the most part in the upper layers of the cutis, reaching or invading the papillæ and obliterating them by pressure atrophy. They contained the characteristic long rod shaped nuclei with rounded extremities, imbedded in a matrix of finely fibrillated protoplasm, with no line of distinct demarcation between the cells. The point of origin in the first case was apparently the

arrector pili, in the second the muscularis vasorum. In other words there was a preponderating overgrowth of involuntary muscular fiber, originating and developing in the cutis, i. e., myomata cutis.

MICROSCOPIC EXAMINATION.

The diagnosis of myoma cutis in probably the vast majority of cases, one might say nearly all the cases, has been stumbled on with aid of the microscope. In some

Fig. 6.—Case 2. Myomatous tissue taken from a mixed type of nevus linearis.

no diagnosis was essayed until after the histologic examination was completed. In not a few the microscope effected a change of diagnosis, from keloid, xanthoma, angioma, zoster, lymphangioma, etc., to myoma, and doubtless *vice versa,* from myoma to other affections. Cases without histologic confirmation would doubtless be accorded doubtful classification value. Recently I

saw a woman, with two small circumscribed patches, the size of a bean, on the lobe of the right ear, each containing a number of glistening, elevated, translucent papules, of two years' duration, which failed to exude any fluid on puncture. The affected ear was the site of severe paroxysmal pain, of spontaneous nature. My diagnosis wavered between myoma and lymphangioma, in favor of the former, until the latter diagnosis was confirmed by histologic examination.

In an affection of this character, in which the microscope plays the essential and important rôle in establishing the diagnosis beyond a question of mere conjecture, reduplication of involuntary muscular tissue to the degree of tumor formation must be classed myoma cutis, irrespective of its congenital or acquired nature, idiopathic or traumatic origin, its red, yellow, brown, pink, translucent or normal skin color, its firm, soft, or elastic consistence, its single or multiple character, its development from arrectors pili, tunica media vasorum, or glandular elements, its simple character or associated hypertrophy of blood or lymph vessels, or other elements. These associated conditions may be qualified by such attributive terms as solitary, multiple, congenital acquired, traumatic, idiopathic, lympho, angio, fibro, etc. If these considerations are properly observed, the total number of cases is materially increased, and the affection, though doubtless frequently overlooked, or mistaken for other cutaneous affections, is not as uncommon as certain well accepted reports indicate.

Simple hypertrophy of involuntary muscular fiber is by no means uncommon. It accompanies many of the chronic inflammations of the skin, particularly those which are accompanied with chronic cutis anserina, and creepy and chilly sensations. I have found it constantly associated with pityriasis rubra pilaris, and present in severe cases to an extreme degree. Likewise in porokeratosis, chronic dermatitis, and other chronic pares-

thetic cutaneous affections. If its simple hypertrophy is easily affected by often slight and dissociated influences, its overgrowth from direct or special agencies is not unlikely.

Of special interest in this direction are the experiments of Vignolo Lutati[31] on animals in reference to the effect of intoxications of the general metabolism on the involuntary muscular fibers and their karyonetic response to stimulating influences. Many cases are re-

Fig. 7.—Hypertrophy of involuntary muscular tissue, taking its origin from an arrector pili in a case of pityriasis rubra pilaris.

ported in the literature without histologic examination, and reported under the head of lymphangioma, lymphangioma cysticum, angioma, xanthoma, keloid, etc., some with, some without histologic reports, that doubtless may have found a place for themselves, with careful and proper observation, under the classification of

31. Arch. f. Derm. u. Syph., lviii, p. 323.

myomata. A very conservative estimate of well defined cases, worthy of general acceptance, will readily place the number of cases which can be enumerated at the present day, at thirty, and possibly forty.

From our present state of knowledge, the diagnosis must depend largely on the pathologic findings. At least this is the opinion which is most generally expressed, and which has received the most ready acceptance. Those who reserve for the affection a purely clinical classification, admit in a measure its shortcomings; one of the most representative of these, Crocker,[2] states:

> With all these variations in symptomatology it is difficult to find any one symptom absolutely constant; but on the whole the most characteristic features are: The extremely slow and progressive development of the tumors in number and size, the tendency to group into close and semicoalescing patches, and their asymmetrical distributions; the moderate size attained by the tumors, which were seldom larger than a pea; the dull red color, and firm consistence of the tumors, with a normal epidermis over them, and their mobility over subjacent parts; their painless character at first with the subsequent strong tendency to most severe paroxysmal spontaneous and provoked pains; and finally they do not recur on removal.

These symptoms, singly and collectively, are not absolutely characteristic of the affection. Each occurs in other affections, and may be entirely absent in myoma; all collectively present, without a pathologic confirmation, could not establish beyond reasonable question the diagnosis. Pain is absent in probably one-half the cases, and when present may be attributed to neuromata or other forms of painful new growths. Wolters'[20] second cases developed acutely and showed a symmetrical distribution. The lesion in Miglionini's[11] case was single, as large as a hazel-nut, and situated on the knuckle. Herzog's[12] was single, on the cheek; Förster,[6] Sokolow,[7] Santesson[10] and Axel-Key[18] were all solitary cases. Jarisch's[17] case was probably of congenital origin, and Wolter's[20] third case situated over a meningocele, can

likewise be attributed a similar origin. The remaining clinical features are sufficiently varied to require no special comment.

The histogenesis of myomata cutis presents some features, which are scarcely less interesting, because of their varied character, than the clinical history. Those who have made histologic studies in this direction are about equally divided in their results: a fairly representative number express their conviction that the derivation of the muscular overgrowth can be traced to the muscular coats of the vessels of the skin, arrectors pili, or the muscular appendages of glandular elements: the remainder frankly admit that their painstaking efforts in establishing a true derivation have been negative in character or purely conjectural. Jadassohn,[25] in his second case, Roberts,[4] Nobl,[32] Neumann,[27] Marschalko,[14] Audry,[9] Broelemann[33] attribute the derivation to the arrectors pili; Crocker,[2] Jadassohn[25] in his first case, Hardaway[34] and Hess[16] to the muscular coats of capillaries; Wolters, Brigidi and Maracacci[26] to the involuntary muscular fibers of the glandular elements and hair follicles. Krzysztalowicz[19] admits his inability to arrive at any definite opinion, but the peripheral portions bore evidence of arrector pili derivation. Jarisch[17] and Lukasiewicz'[18] derivations are indeterminate as respects arrectors pili, glands, or blood vessels. Huldschinsky[5] attributes to the blood vessels a probable derivation. Wolters[20] attributes the probable derivation of his third case to the capillaries, although glandular elements were sparingly in evidence, and a portion of the growth could be readily traced to arrectors pili. Interesting, if not amusing, is the latter's conjectural explanation of the growth and development of the myoma which was seated over a meningocele, on the basis of a

32. Arch. f. Derm. u. Syph., 1906. lxxix, p. 31.
33. Arch. f. Derm. u. Syph., 1904, p. 163.
34. Am. Jour. Med. Sci., April, 1886, p. 511; also Jour. Cut. Dis., 1904, p. 375.

compensatory hypertrophy, on the part of Nature to arrest the efforts of the pulsating meningocele to effect a rupture. Personal observation leads me to suspect from the peripheral appearance that the arrectors pili fostered strongly the myomatous hypertrophy in the first case and the musculi vasorum in the second.

It is impossible to determine, however, beyond purely conjectural speculation, whether the muscular hypertrophy had its origin and development in these two respective areas, or whether these structural areas yielded to the general stimulus, which expended itself on all involuntary muscular tissue of the affected area, in degree proportionate to the amount of each present, and its more favored distribution. The latter explanation seems to be the more plausible one, and is analogous to the hypertrophy of all glanduar and epithelial tissue in the immediate neighborhood of an epithelioma, which owes its overgrowth to a similar form of stimulating influence.

On this basis the diversified character of the histogenesis, from glands, arrectors pili, vessels, and all forms of involuntary muscular tissue, is readily explained. All the diversified clinical and physical phenomena find their best explanation on the basis of some such unknown influence, which stimulates the involuntary muscular tissue of the skin to a preponderating development and overgrowth, irrespective of age, area, predisposing causes, and similar inconstant conditions.

The tendency may be inherited, present from birth, and called into activity by the influences of puberty, trauma, etc. Inasmuch as all tissue in general is subject to similar changes, involuntary muscular tissue is probably no exception, and doubtless shares in all the variations of pathologic change, from single hypertrophy to preponderating and irregular conglomerate overgrowth, with all the corresponding gradations of

clinical and physical change. In that event the microscope affords the easiest, best and most accurate determination as regards what constitutes, in a generally accepted sense, myomata cutis.[35]

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35. For further literature the reader is referred to Arzovan and Vaillard: Ann. de Derm. et. Syph., 1881, p. 60; Fox: Brit. Jour. Derm., 1902, p. 56; Klob: "Path. Anat. d. Weibl. Sexualorg," 1864, p. 482; Vidal: Jour. Cut. Dis., 1885.

ENDOTHELIOMA OF THE SKIN.

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New growths composed of endothelial cells, and arising from the intima of the blood vessels and lymphatics, are well recognized pathologic entities. They are not infrequent in the internal organs, especially in the parotid and salivary glands, and in connection with the serous membranes. It is only of recent years, however, that they have been differentiated from other and commoner neoplasms; for in appearance the endothelial cells that make up their mass vary from a large nucleated somewhat rectangular cell very like the epithelial elements of carcinoma, to a smaller, rounded cell resembling those characteristic of sarcoma. Borst[1] voices the opinion, now general with pathologists, that to the class of endotheliomata undoubtedly belong many of the cases of atypical or mixed new growths which have been recorded under such names as endothelial carcinoma, endothelial sarcoma, angiosarcoma, cylindroma, fibroplastic tumor, lymphangioma, lymphatic cancroid, etc. Their differentiation from carcinomatous and sarcomatous new growths is important both from a prognostic and a therapeutic point of view. For the endotheliomata are essentially benign tumors, growing very slowly, having no tendency to metastasis or lymphatic gland involvement, and are not prone to relapse after removal.

1. "Die Lehre von dem Geschwülsten," vol. I, p. 295.

Recorded cases of endothelioma of the skin are as yet comparatively few. They have varied so much in appearance that it must be confessed at the outset we do not appear as yet to have any reliable clinical criteria for their recognition. Thus in Spieger's[2] three classical cases, which have been the basis of most of the subsequent studies of the disease, the scalps were covered with a considerable number of closely aggregated pea to orange sized hard tumors. In Braun's[3] case there was a single, quarter dollar sized ulceration with hard, car-

Fig. 1.—Endothelioma cutis.

cinoma like edges. Allen's[4] case had a single cartilaginous tumor of the scalp; while in that of Hartzell[5] there was a softer mass of a yellowish-red color. Von Waldheim[6] had a case in which there were multiple, flat, smooth tumors with an unaltered integument. In a

2. Monats. f. prak. Derm., 1900, xxx, p. 76.
3. Langenbeck's Arch., xliii, 1; also Monats. f. prakt. Derm., 1893, xvii, p. 585.
4. Monats. f. prakt. Derm., 1900, xxxi, p. 47.
5. Brit. Jour. Derm., October, 1904.
6. Arch. f. Derm. u. Syphil., 1902, lx, p. 215.

number of other cases fatty, calcareous, and other regenerative changes seem to have occurred. Thus Kromayer[7] records one consisting of numerous minute yellow tumors, and Perthes[8] one that had undergone calcification.

It is very evident, therefore, that, in the present state of our knowledge of the subject, the diagnosis of cutaneous endothelioma can only be made positive with the aid of the microscope. A study of the recorded cases leads me to the following insufficient conclusions: Most cases of cutaneous endothelioma have occurred on the scalp; they have appeared most often as single or multiple, flat or pedunculated tumors; they are not prone to

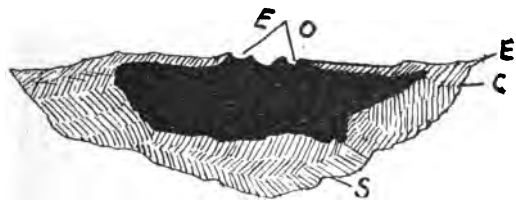

Fig. 2.—Endothelioma cutis. Sketch of the macroscopic appearance of the bisected tumor, double life size. EO, epidermic orifices; E, epidermis; C, corium; S, subcutis.

break down, but are very liable to undergo degeneration, more especially of the fatty variety, and so to show a more or less marked yellow color; they grow very slowly and show no evidences of malignancy.

CASE REPORT.

I record the following case as a contribution to the study of the disease because it was diagnosed as sarcoma before extirpation, and because it shows the as yet unrecorded pigmentary degeneration in a case of the kind.

History.—Patient, an otherwise healthy married woman, aged 27, was sent to me by Dr. Schulhofer, Oct. 16, 1905. Two years before, she first noticed a black spot as large as a French pea on the outer border of her right foot. It

7. Virchow's Arch., 1895. cxxxix.
8. Monats. f. prakt. Derm., 1895, xxi, p. 658.

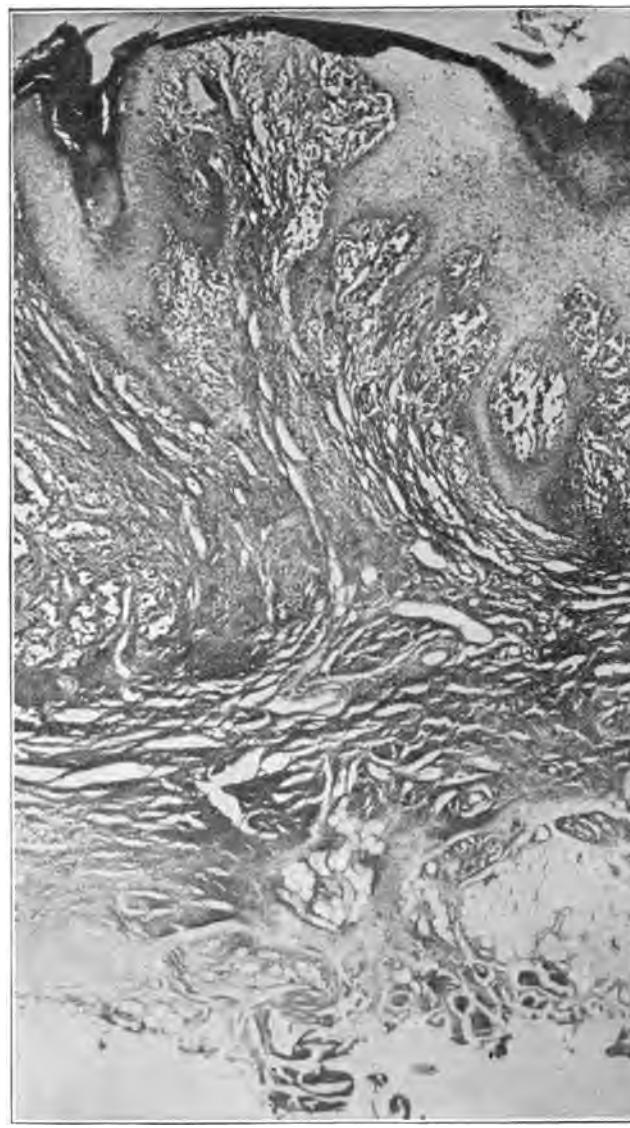

Fig. 3.—Endothelioma cutis (× 33). Upward proliferation of dilated lymphatics from the interlobular plexus. In many of the spaces the cells have fallen out.

was slightly elevated and did not discharge or trouble her in any way. She paid no attention to it. During last summer she noticed that there would be blood on her stocking after walking, and that the tumor had grown considerably larger. Since then she has had some trouble from it. It would heal for a few days and then break open again and discharge a seropurulent fluid mixed with blood. It was undoubtedly increasing more rapidly in size.

Examination.—Just posterior to the middle of the outer border of the right foot there was an irregularly circular coal

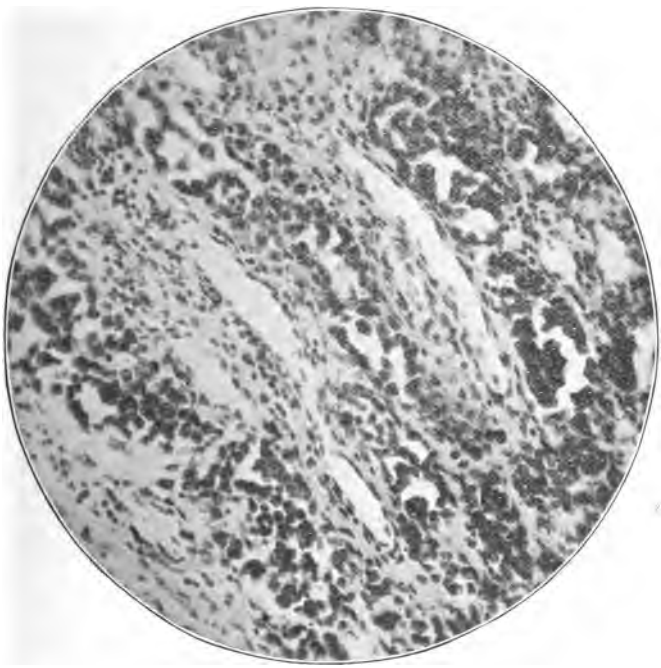

Fig. 4.—Endothelioma cutis (× 200). Dilated lymphatics stuffed with endothelial cells. In some these latter have fallen out during preparation.

black lesion. The blackness was absolute and had no tinge of brown or blue, as if a piece of ebony had been imbedded in the skin (Fig. 1); and the infiltration was limited sharply as if with a fine pen, the surrounding skin showing no macroscopic evidences of any inflammatory reaction. The mass was ¾ in. in its longest diameter by ½ in. in its shorter diameter. It was irregularly circular, with projections and

was very slightly elevated. Its surface was smooth and covered with an apparently unchanged epidermis, save in its center, where there was a small pea-sized excoriation with two or three minute orifices in it from which a very little bloody serum exuded. There was neither pain nor discomfort from the growth, save that occasioned by the stocking sticking to the dried exudation. With the finest wire probe I could not penetrate over a line into any of the openings. In consistency the mass was a little harder than the skin and subcutis in the location affected (Fig. 1).

Diagnosis.—My first diagnosis of melanotic sarcoma was made with considerable hesitation; for the growth of the tumor

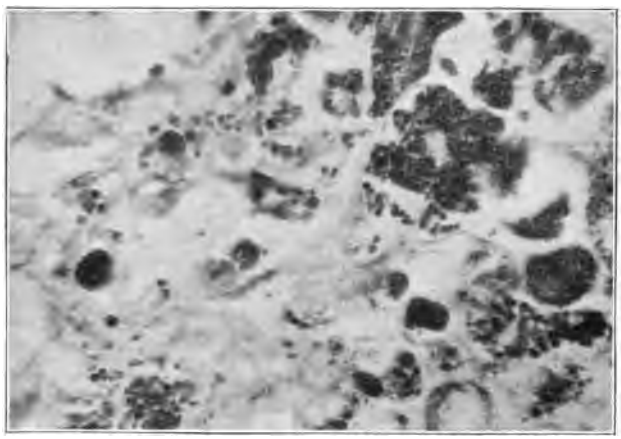

Fig. 5.—Endothelioma cutis (× 800). Pigment accumulation in the endothelial cells. From the margin of the tumor.

had been very slow indeed, its blackness was intense beyond anything that I had seen in a condition of the kind, its absolutely linear demarcation from the surrounding tissues was unusual, and there was no history at all of the existence of a mole or wart at the spot previous to its appearance. At the Manhattan Dermatological Society, where the patient was shown in November, the diagnosis was generally concurred in. No treatment was advised and the patient was kept under observation.

Operation.—By the end of November it was very evident to me that the tumor was increasing in size, and there had been a smart hemorrhage from it after a bruise; so I excised it December 3 under local beta-eucain anesthesia. It was

necessary to cut deeply into the subcutaneous tissue of the sole to get it all out, but even during the excision the coal-black tumor mass was absolutely distinct and circumscribed in the tissues. On bisecting the excised mass it was apparent that the tumor originated in the cutis and extended down-

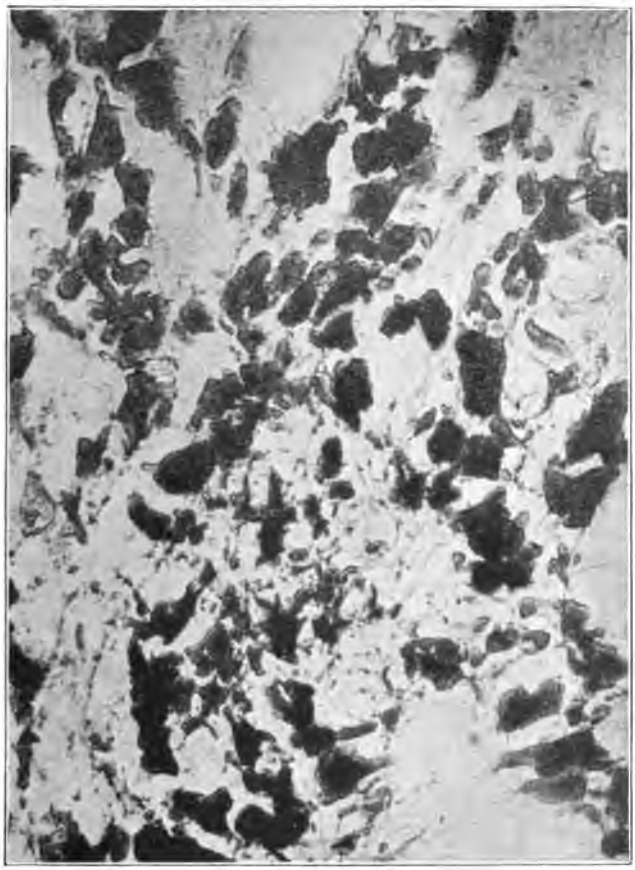

Fig. 6.—Endothelioma cutis. An unstained section from the center of the tumor, showing the endothelial cells completely filled with pigment.

ward into the subcutis; the epidermis could be seen macroscopically as a fine uncolored line extending over the surface of the infiltration, except at the two places where the surface openings were present (Fig. 2). From its location it

was, of course, impossible to close the wound; it was dressed and allowed to heal by granulation. In three weeks it had cicatrized completely. In March, 1906, the scar was entirely normal; at present, May, 1906, Dr. Schulhofer informs me that lately there has been a reappearance of the tumor *in situ*. As the tumor was growing rapidly a wide excision was done again this fall.

Microscopic Examination.—Portions of the excised tissue were hardened in alcohol and in Fleming, cut serially in paraffin and stained with Van Giesen, polychrome methyl blue and alum carmin for general view, resorcin-fuchsin for the elastin, depigmented and stained variously, etc. The new growth was found to be in the corium, extending into the subcutis and involving the epidermis only secondarily. It was composed entirely of proliferated, dilated lymphatic vessels stuffed with cells.

The new lymphatic growth can be distinctly seen stretching upward from the transverse subcutaneous lymphatic plexus in clubbed and branching masses, many of which penetrated the epidermis up to the corneous layer and perforates even that at the surface openings in the tumor mentioned above. There was a marked acanthosis of the prickle cell layer at the margins of the tumor (Fig. 3).

The stratum corneum of the epidermis was very thin where it was present, consisting of only four or five layers of cells, though the tissue comes from the sole of the foot. In some places only the stratum disjunctum was left; and here there was persistence of the nuclei and pigmentation of the corneous cells. Over the most prominent portions of the tumor and especially in the neighborhood of the external orifices, the epidermis was entirely wanting. The granular and prickle cell layers, on the other hand, were greatly hypertrophied in places, consisting of 15 to 20 rows of cells and projecting down in clubbed masses between the lymphatic overgrowth. The cells of the granular layer show marked karyokinesis, doubled nuclei, etc., and many of them are vacuolated. Keratohyalin was abundant; but the stratum lucidum is not demonstrable.

The papillary layer was entirely absent where the tumor is well developed. At the margins of the growth where the acanthosis was marked, there was a small amount of perivascular small-celled inflammatory infiltration. This was also present in small amount at the base of the tumor. The collagenous tissue between the lymphatic nas masses was normal, the elastin, however, was diminished. The new

growth itself was composed entirely of hypertrophic and dilated lymphatic vessels stuffed with cells (Fig. 4). In many places these cells had fallen out; in others the masses were intact. The cells were polygonal or rounded large nucleated structures. In some places their protoplasm and nuclei were distinctly visible, though they invariably contained pigment granules. But most of them were filled with pigment masses, aggregated into rounded clumps (Fig. 5). Very many of them were apparently composed of masses of round pigment clumps alone, both cell protoplasm and nucleus being entirely obscured. Careful examination, however, revealed the presence even in these latter of the well preserved cell membrane, showing that the process was an infiltration and not a true cell degeneration (Fig. 6). Sections bleached with chlorin, potassium permanganate, and oxalic acid revealed the intact though shriveled endothelial cells. The ammonium sulphid method showed the pigment to be true melanin and not of hematogenous origin.

The new growth with which we are dealing, therefore, belongs to the class formerly called lymphangioma; and since it was composed of an overproliferation of the endothelial cells of the lymphatics, we now classify it as a lymphatic endothelioma, or lymphangioendothelioma. It was peculiar in the excessive amount of melanotic pigment in the endothelial cells, causing its clinical resemblance to melanotic sarcoma. The essential difference in the prognosis of the two conditions renders their clinical differentiation important.

DISCUSSION.

DR. L. DUNCAN BULKLEY, New York City, said that these cases of endothelioma of the skin are very rare. An interesting example of the affection recently came under his observation. In this case the lesion, as in Dr. Gottheil's case, was on the foot. The patient was a man of 50 years or over, who was being treated in the surgical out-door department of the New York Skin and Cancer Hospital. There was no pigmentation, and when Dr. Bulkley first saw it, he examined it in a casual way, and was inclined to look on it as an epithelioma. It was excised, and a pathologic examination of it made at the Cornell Laboratory proved it to be an endothelioma. It recurred a number of times after excision, but finally disappeared entirely under the use of the *x*-rays.

DR. M. L. HEIDINGSFELD, Cincinnati, said that from his study of the disease he can not help coming to the conviction

that the division of these various forms of malignant epitheliomata and sarcomata of the skin is a little bit too arbitrary. Various layers of the skin are at times involved by these growths; sometimes the hair follicles, sometimes the sweat glands, and the preponderance of the involvement of one of these elements over another seems to be enough ground to constitute a type. He said that cases have come under his observation which were pathologically very similar to the one reported by Dr. Gottheil, and chemically were merely ordinary types of epithelioma, the malignant changes being confined chiefly to the sweat glands. In a case of epithelioma of the forehead, which was typical in its clinical appearance, a section of the lesion was removed and had the microscopic appearance of an epithelioma; another section taken near by possessed all the histologic characteristics of a sarcoma. In malignancy there is a hypertrophy of all the involved tissues, irrespective of their nature and character, called forth by the still undefined and unknown stimulus, and the question naturally arises as to whether or not it is always justifiable to make an arbitrary division of these various types.

Dr. Edmund L. Cocks, New York City, recalled a case which was presented at two of the dermatologic societies in New York as an example of molluscum fibrosum. One of the lesions was excised and examined by Dr. Gottheil, and a microphotograph of the lesion which was subsequently presented showed the endothelial cells running from within outward.

Dr. M. L. Heidingsfeld, Cincinnati, said that his remarks were not meant as a reflection on the excellent character and high class of the work done by Dr. Gottheil, but were simply intended to express his belief that the more he studies the pathology of malignant conditions the more of an agnostic he becomes in that particular direction.

Dr. W. S. Gottheil, New York City, said that he does not agree with Dr. Heidingsfeld in regard to the microscopic findings in these cases. The difficulty is in the fact that if a man studies one portion of a growth with the high-power objective he comes to one conclusion, while a study of another portion leads him to a different conclusion. Dr. Gottheil prefers the half-inch objective to the immersion lens; a general view of the chief pathologic changes being more important for diagnosis than a minute study of one corner of it. If the endothelial proliferation involves the lymphatic spaces, he thinks the diagnosis of endothelioma is justified.

LUPUS VULGARIS OF THE EAR IN RELATION TO ITS LATE RESULTS.

A. RAVOGLI, M.D.
CINCINNATI.

Lupus vulgaris, the true exponent of the cutaneous tuberculosis, although so well studied and thoroughly known, still deserves consideration. Usually it is a disease of a long and tardy process. It remains for years in the form of small, innocent nodules, which scarcely call the attention of the patient for any treatment, and yet its consequences are very serious, and at times fatal. This prompts me to refer to the history of two cases which have lately come under observation.

CASE REPORTS.

CASE 1.—M. J. T., aged 52, a man of splendid physique, always had good health. No one in his family had ever shown signs of tuberculosis. His children are types of perfect health and vigor.

History.—At the age of 28 he began to notice some little pimples on the lobules of the right auricle. He did not think anything of it and let them go until they began to ulcerate. Other nodules were formed in the concha, which, on ulcerating, began to make their way down into the tissues. He consulted several physicians, who all agreed it was a case of cancer. The patient was greatly discouraged, and for a long time contented himself with a simple medication to keep the ulcerated surface clean.

Examination.—The process, however, kept progressing. When he was first seen, after nineteen years, the auricle had been nearly destroyed. A piece of the upper portion of the helix was ulcerated and hanging down, which was removed and kept for biopsy. The antihelix and the concha were entirely destroyed and the surface was converted into two deep,

tuberculous ulcers. One of them, of the size of a half dollar, working backward and up on the squamous and on the mastoid process, showed at the bottom decayed and ulcerated bone. The other ulcer was seated in front and underneath the auditory canal, and with its granulations and the edematous

Fig. 1.—Tubercular ulcer of the ear from lupus of 18 years' standing.

swelling of the tissues, had entirely closed the meatus. Its progress had gone so deep that the auditory function had been totally destroyed, and patient had paralysis of the eyelid and of the facial nerve of the same side. This showed that the

tuberculous process had spread deep in the pars petrosa, had destroyed the cavum tympani, and had very likely damaged the labyrinth. From the facial paralysis we can argue that the same process had made its way into the canalis Fallopii, producing pressure on the seventh pair, the facial nerve. This condition became more and more apparent toward the end, when patient could no longer swallow his food, on account of the anastomoses between the comunicans and the nervi palatini descendentes, which are motor ramifications for the muscles of the palate.

Treatment.—When patient was taken under treatment the ulcers were touched up with pure lysol, the granulations were scraped off with the sharp curette, and in a short time the condition of the ear was such as to promise a speedy recovery. The improvement, however, was only illusive, because after some time the ulcer begun to extend upward on the squamous portion of the temporal and backward, with necrosis of the mastoid process. Opening the mastoid cells in a downward direction, the ulcerative process, round in shape, with thick infiltrated edges, showed at the bottom of the ulcer the exposed muscles and the ramifications of the nerves. At this point deglutition could not be effected, the digestion was impaired so much that the patient lost over 40 pounds. He became very weak, and the end came very likely from the implication of the nervus vagus in the ulcerative process.

In this case there were used also the Finsen light, *x*-rays, and every device which could have been suggested in the case in order to stop the tubercular process, but nothing succeeded in doing so. While the patient was under my treatment, over one year, he never had any fever or showed symptoms of infection in the general system. The symptoms were only of local origin, consisting in paralysis and in a burning and boring pain, which was especially troublesome at night. The application of the *x*-rays only had a beneficial effect on this continuous pain.

CASE 2.—F. W. H., farmer, aged 26, of splendid physique, had always enjoyed good health.

History.—In his mother's family some members had died with tuberculosis. He was in Colorado camping for some time in order to attend one of his family who was affected with tuberculosis. He has never shown a sign of pulmonary trouble,

nor has his family. The climate and the open air treatment proved beneficial to his relative, and he returned to his Kentucky farm. He claims that his trouble started from a wound produced by a corn cob striking his right ear in 1886. The wound ulcerated, for which he sought medical attendance. The auricula was scraped, and after the operation erysipelas set in, which caused loss of tissue. He has received medical attention off and on, as he was discouraged by the stubbornness of his affliction. Some two years ago he called on me for treatment. The auricula had been totally lost and the whole surface was ulcerated. Indeed, he called on me more for a patch of whitish nodules in the form of tuberculosis lupoides affecting

Fig. 2.—Tuberculous infiltration free from limits.

the zygomatic region, extending to the internal angle of the right eye. The tuberculous ulcer of the ear was for him of a secondary importance. The tuberculous nodules of the face were scraped off and cauterized with pure lysol, and with this method was obtained a regular superficial scar, which is scarcely visible.

Treatment.—The ulcer of the ear was treated with the light treatment of the Lortét and Genou appliance. In the beginning it did much good, so much as to make me hope for a perfect recovery. The surface, however, began to ulcerate again, and the treatment was discarded. The *x*-ray treatment came next, which did not produce any beneficial effect. For a while I have limited myself to touching the new tuberculous ulcers

with pure lysol, and dressing the surface with sublimate gauze. The lysol has often been substituted by iodoglycerin.* In this way the tuberculous ulcers have been kept in check and healed up. When the best cicatrix had been obtained, suddenly under the scales small miliariform tuberculous ulcers formed, round or oval shaped, with a yellowish bottom, and with a tendency to spread. The ulcerated surface is somewhat triangular in shape, with the apex at the place of the destroyed lobulus, and with the base on the squamous portion of the temporal bone (Fig. 1). One of the angles reaches the mastoid process, the other the zygomatic. The bony substance of the squamous portion of the temporal has been denuded and has

Fig. 3.—Lupus tubercle in the derma.

fallen in a superficial necrosis, which has sloughed off and is at present cicatrized. The internal ear has not been disturbed and a small piece of cartilage still remains, forming the meatus of the auditory canal. The hearing is maintained perfect, so that if a little secretion stops the canal he requests to have it removed on account of closing his ear.

ETIOLOGY.

In both cases I examined the secretion of the ulcer by smear preparation, and have been able at times to

* This consists of:

Iodin pure	gr. x	65
Potassium iodid	3ss	2
Glycerin	3vi	25

Mix. Use externally.

see the presence of the tubercle bacilli. Of its presence there could never be any doubt, after seeing the lupoid reproduction on the patient's face in Case 2, and not long ago the formation of a warty production on the back of his left hand, which was a clear case of tuberculosis verrucosa. It was easily destroyed by cauterization with pure *lysol,* leaving only a superficial scar.

It seems that the tubercle bacillus which does not find a good ground for its development in the derma, when it affects loose connective tissues, or its equivalent, as fasciæ, bones, etc., takes on great activity. The derma

Fig. 4.—Tuberculous process, invading Haversian canal, from a decayed scale of bone.

with its resistant stroma and elastic fibers, more easily surrounds and encapsules the tubercle bacillus, which sometimes remains a long time in the skin in a dormant state without producing infection. The bacillus may remain concealed for a period of years in the scars of lupus, as a potentiality without causing trouble. But the time comes when, waking out of this dormant stage, it develops tubercles with the reproduction of the dreadful process and with destructive consequences.

The etiologic origin of lupus vulgaris was established from the discovery by Koch of the bacillus tuberculosis. The histopathologic nature of lupus to attack connective tissues was at first revealed by Auspitz,[1] and confirmed by Virchow,[2] so much so that the question seemed settled forever. When Schüppel found the giant cells in tubercular glands, and Bizzozero[3] and Friedland[4] demonstrated their presence in lupus of the skin, then the microscopic anatomy of this disease took a new direction. Lang[5] thought that the diagnosis of lupus rested on the finding of the giant cells. But he also called

Fig. 5.—Papillary proliferation from lupus infiltration.

attention to proliferation of the connective elements of the blood and lymph vessels forming meshes around the cellular infiltration of the tubercle.

The interest, however, in the part which the connective tissues play in the process has remained, and I believe that to them is due the different reaction of the

1. "Ueber die Zelleninfiltrationen der Lederhaut bei Lupus," Wien. med. Jahrb., 1864.
2. "Geschwülste," vol. ii, quoted by Lang.
3. "Tuberculose der Haut," Centrbl. f. d. med. Wiss., 1873.
4. "Untersuchungen über Lupus," Virchow, Arch., lx.
5. "Zur Histologie des Lupus," Vierteljahr, 1875.

skin in the different morbid types of cutaneous tuberculosis. Since the experiments of Krompecker and Zimmermann[6] proving equal virulency of the tubercle bacilli in a rapidly developing case of lung tuberculosis, and in a chronic tuberculous process of the bones, we can not attribute the difference in the forms of cutaneous tuberculosis to a different intensity of virulence of the bacillus. The difference of clinical pictures may be also attributable, according to Pick,[7] to the difference in the nutrient soil, rather than in the source of the causative factor. From my observations I infer that so long as lupus remains in the domains of the thick structure of

Fig. 6.—Tuberculous infiltration invading cartilage cells.

the derma its progress is greatly restrained. When lupus has affected the loose connective tissues of the skin, then it is no longer under any control, and in a short time is reproduced in a nodular or in a diffused form, which represents miliary tuberculosis of internal organs.

PATHOLOGY.

The infiltrating cells which form the lupus nodules, by faulty process of their protoplasma have no longer

6. Centribl. f. Bact., 1903, xxxiii, p. 580.
7. "Tumorlike Forms of Tuberculosis of the Skin," Transl. by Klotz, Journ. Cut. Dis., July, 1904.

the power to appropriate nutritious materials carried by the blood, and die, forming foci of degeneration. Unna[8] names this kind lupus radians, when in consequence of the pressure on the tissues from free foci, degenerative changes soon take place. Tubercular infiltration does not form nodules any more, but spreads in all directions into the spaces of the tissues. Figure 2 gives a good idea of the irregular infiltration, while Figure 3 shows lupus nodules surrounded by collagenous fibers. In the first, all presence of plasmom is lost, and to plasmom is due the faculty of encapsuling tuberculous infiltra-

Fig. 7.—Tuberculous process invading cartilage.

tion. In the other the infiltration is guarded by the connective tissues. In cases of radians lupus the tubercle bacilli act with more intensity and after the dissolution of the plasmom easily destroy the other tissues. Figure 1 clearly shows the spreading of tubercular infiltration around an Haversian canal. There is no plasmom to restrain the diffusion of the tuberculous process.

It seems that the intensity of the virulence of the tubercle bacilli is prevented from spreading by the solid

8. "Die Histopatologie der Hautkrankheiten," p. 579.

structure of the derma. Figure 5 has been taken from a vegetating focus of lupus, growing on the nasal angle of an inferior eyelid in the patient in Case 2. It was the result of an accidental inoculation. Plasma cells are thickly disposed in the form of a wall around the foci of the infiltrating lupus. They are lined in the papillary layer around the blood vessels and down in the thickness of the derma. It seems they are a protection to the blood vessels which are not compressed by the infiltrating process, and are spared from destruction. The plasma cells are mostly made by the connective tissue corpuscles, and by the collagenous fibers. The elastic fibers are also well maintained between the lines of the plasma cells.

The tuberculous infiltration when out of control from the plasma cells spreads and invades cartilage and bone. In Figures 6 and 7 the line of tuberculous infiltration is clearly shown, invading the cartilage whose cells soon die. In the same way as shown in Figure 4 the bone cells invaded by the tuberculous infiltration are converted into a tuberculous mass. The degenerative process soon takes place and tuberculous ulcers with necrotic bottoms result in the bones and in the cartilages.

When the tuberculous process has reached the subcutaneous tissue, it forms large nodes, or tuberculous gummata. It finds also an easy way to spread in every direction and attacks fasciæ, periosteum, and the bone is no obstacle to its invading virulence.

This kind of lupus causes an acute serofibrinous inflammation, which causes the tissues to be imbibed with lymph, and the quick spreading of the process. In one of my cases a lady who has been afflicted for many years with lupus of the face and arms, now healed, has recently shown tuberculous nodules on her left foot and leg, with hard persistent edema of the whole foot and toes. The nodules made their appearance as red round patches of the size of a dime or greater, are swollen and exceedingly painful. In a short time they appear soft,

showing fluctuation. When opened, a scanty bloody serum issues, together with adherent masses of necrotic tissues. In the smear preparation of this serum, tubercle bacilli were present several times. It seems that a degenerative condition affects tissues and cells, causing a fluidification of the substance of the cells. The lymph spaces filled with abundant serum offer good channels for the spreading of the process as interstitial edema. The serum which infiltrates the tissues is soon coagulated and the process through it spreads to the deep structures. The virulence of the tuberculous infection causes the acute inflammation and the prompt fluidification of the infiltrating elements, and the tissues are converted into necrotic masses. The edema, which forms lupus tumidus, is remarkable on account of its development and of its persistency. Whenever it is present it shows that lupus is of rather a severe nature.

Indeed, any case of lupus has to be considered as a serious affection, and has to be treated to the end. The cases referred to had been dragged along for years without accomplishing any permanent curative result. The disease which at first looked like one of little importance, has taken such proportions as not only to mutilate the patient, but to menace life. Prognosis, therefore, requires great seriousness, and the patient must realize that he has to be cured in the beginning of the disease, because later on, when it has spread, cure will be more difficult, or probably impossible.

TREATMENT.

In reference to the treatment, I have used every possible means, but the results have been discouraging. The application of Finsen light with Lortét and Genou apparatus, in the first case was of no benefit, in the second case it proved at first beneficial. The process, however, took more severe proportions, so much so that I was obliged to change treatment. The exposure to *x*-ray proved beneficial in the first case, so that it had caused

nearly all ulcerations to heal, but it was unsuccessful in the second. In the first case the *x*-ray treatment had stopped the continuous pain, in the depth of the ear, in the second it irritated and caused so much discomfort that its use had to be stopped. In both cases I had moments of hope, the process seemed conquered and recovery assured. Suddenly new ulcerations were formed, undermining the bones. In the first case the process had gone too deep and scraping was not advisable. In the second case, in which the process was more superficial, the whole surface was scraped off and covered with skin grafts. For a while it seemed to be healing, but after a time new ulcers were formed in the center and in the periphery, which soon left the ulcerated surface in the former condition.

The best results so far have been obtained from the applications of pure lysol. The new ulcers are touched up with a piece of cotton dipped in lysol; the pain is not excessive. It produces a coagulation of the serum of the tissues, so as to form a hard, whitish escara, which falling out leaves a healthy tissue which soon cicatrizes. In the case of diffused lupus of the foot, I have obtained the best results from lysol. When the nodules appear, I open them and remove their contents, and insert a piece of cotton saturated in lysol. In a short time the nodules are brought to recovery.

DISCUSSION.

DR. M. L. HEIDINGSFELD, Cincinnati, asked if the tuberculin test had been applied in the cases reported by Dr. Ravogli. Dr. Heidingsfeld has resorted to this test in many cases with the most satisfactory results, and he places great reliance on it. He can recall cases which he regarded as tuberculous, and which on histologic examination proved to be something else after the tuberculin test had proved negative. In certain superficial forms of epithelioma which have a tendency to progress very insidiously, the resemblance to lupus is very close, and the injection of tuberculin is a valuable diagnostic aid. Many cases, he said, are doubtless reported and recorded as tuberculosis which would be given an entirely different interpretation if tuberculin were more generally employed. Of the value of the Finsen rays, Dr. Heidingsfeld said that the

poor results often attributed to that method of treatment may be more justly ascribed to defective technic. A 5-ampere lamp can not be expected to be as efficacious as a 50-ampere lamp, and he does not believe that anything under a 25-ampere lamp can be depended on to give any results.

DR. A. RAVOGLI, Cincinnati, said that he has given tuberculin a prolonged trial in tuberculous affections of the skin. He began with the older tuberculin, and afterwards used the tuberculin T. R., and his experience with both of these preparations has been very discouraging, as he has seen serious results following the injections. He mentioned the case of a woman with lupus erythematosus who was given an injection of tuberculin T. R., which was followed by a high temperature and marked local reaction. Subsequently she had a relapsing fever, and died with the symptoms of pulmonary tuberculosis within a month or two. He also mentioned another case which he saw in consultation, in which an injection of von Ruck's preparation of tuberculin had been made. At the site of the injection a tuberculous ulcer developed, which subsequently involved the neighboring glands, and the patient died in the course of a few weeks. Since then, Dr. Ravogli said, he has entirely abandoned the use of tuberculin in spite of some fairly satisfactory results with the older preparation, which he published a number of years ago in the Chicago *Clinic*. In his work in the future he will refuse to resort to it unless he can be convinced that it will not injure the health of his patients. The diagnosis of tuberculous affections of the skin can be made by inoculations in lower animals without resorting to tuberculin. The method in which the lesion extends, its clinical appearance and anatomic and pathologic features usually furnish sufficient data on which to base the diagnosis.

CONTRIBUTION TO THE STUDY OF ERYTHEMA INDURATUM (BAZIN).

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Besides those dermatoses which are known to be of tuberculous origin, like lupus vulgaris, tuberculosis verrucosa cutis and scrofuloderma, there are to-day numerous other skin lesions regarded as closely related to tuberculosis, if not entirely of tuberculous origin. One of them, lichen scrofulosus, the older Hebra regarded as associated with tuberculosis. He found that 90 per cent. of patients so afflicted were youthful individuals, with cervical and other kinds of lymphadenitis, periostitis, caries, necrosis, or affected with ulcerating scrofulodermata, symptoms which are characteristic of what we call "scrofulosis," making the name of lichen scrofulosus a proper one. In some inveterate cases of this disease acne-like lesions appear with or without pus formation. Hebra called them acne cachecticorum. He found it associated with a moist or dry seborrhea, causing the so-called pityriasis tabescentium. A third affection brought by him in connection with tuberculosis is chromophytosis. It appears with predilection in those phthisical patients who are affected with seborrhea and hyperidrosis.

TUBERCULOSIS AND CUTANEOUS DISEASES.

A group of other skin affections more or less closely allied or even identical, but known under different

names, have of late been brought into the domain of the octopus tuberculosis. These are: folliculitis exulcerans (Lukasiewicz) or hydroadenitis suppurativa (Pollitzer). Kaposi's acne telangiectodes, Barthelemy's acnitis and follicilis, known also as papulo-necrotic tuberculides or necrotic granuloma (Johnston's). The sarcoids of Boeck, the pityriasis rubra of Hebra, synonymous with Besnier's tuberculous erythrodermia; the extremely rare angiokeratoma, the lupus pernio and, above all, the much contested lupus erythematosus, even sclerodermia and keloid are regarded as associated with tuberculosis. The erythema induratum Bazin is in a manner a very important exponent of this group, called by Darrier *tuberculides cuianées*. The fact that the important group of erythemas is due to autotoxins of gastrointestinal or other origin has led observers to assume that the enumerated group of skin lesions may also be of endogenic origin. This hypothesis was supported by bacteriologic as well as histologic findings.

It is interesting to follow the evolution of this group of tuberculides as derived from the classical tuberculous affections of the skin. The grouping of seemingly different disease forms into a system of common etiology is at first glance surprising. While lichen scrofulosorum, acne cachecticorum, as mentioned before, were thought to be associated with scrofulotuberculous taint, the real import of such a connection could at that time only be surmised, but not determined. The histologic researches of Jacobi,[1] who found bacilli in his two patients, and later of Gilchrist,[2] who found histologic features in lichen scrofulosus identical with the structure of the miliary tubercle, also Sack,[3] Boeck's and Hutchinson's[4] investigations, finding the same element in the disseminate form of lupus erythematosus, and finally

1. Verhand. d Deutsch. Derm. Ges., Third Congress, 1891, p. 69.
2. Johns Hopkins Hosp. Bull., 1899, p. 84.
3. Monatsch. Pract. Derm., xiv, 1892, p. 457.
4. Arch. Derm. and Syph., 1898, xlii.

the researches of Hallopeau Darrier,[5] Brocq[6] and others gave the impetus for further studies in this line.

We must look on the tuberculous taint as a predisposing cause or, rather as a favorable culture medium for the acquisition of different skin lesions. Unfavorable circulatory conditions in their wake may produce lupus pernio or angiokeratoma. But there certainly must be a more intimate association with tuberculosis in such lesions, in which, although the bacilli have not been found, histologic examination revealed tuberculous features. These are folliclis, Boeck's sarcoids, lupus erythematosus, etc. In a series of other lesions like lichen scrofulosus, Jacobi and more recently Wollf[7] have demonstrated tubercle bacilli, while Haushalter,[7] Pellizari and others have reported positive inoculation results. Again in erythema induratum, although bacilli could not be demonstrated, yet Thibierge and Ravout,[8] also Carlé,[9] succeeded in obtaining positive results by inoculations.

These different results gave rise to two kinds of hypotheses as to the origin of these lesions. They are held to be due either to the toxins of the bacilli, located somewhere in the body, or to the bacilli themselves, dead or alive, which are carried to the skin by the blood current and there act as a morbific factor. The former are aptly called toxi-tuberculides and the latter bacilli-tuberculides.

REVIEW OF LITERATURE AND PATHOLOGY.

It would exceed the limits of this paper to analyze the abundant literature on this subject. Briefly said, the theory of toxi-tuberculides has its main representative in Klingmüller,[10] who supports his contention with the fact that injection of tuberculin has caused the appear-

5. Annal. Derm. et Syph., 1892, p. 45.
6. Annal Derm. et Syph., 1897, p. 50.
7. Cited in Mracek's Handb. d. Hautkr., 1905, p. 262.
8. Annal. Derm. et Syph., 1899, No. 6.
9. Lyon: Médicale, 1901, No. 10.
10. Cited in Mracek's Handb. d. Hautkr., 1905, p. 263.

ance at the point of injection of lichen scrofulosus lesions and emphasizes his hypothesis by the lack of tubercle bacilli in the lesions, their acute onset, benignant course, discrete appearance, spontaneous involution and non-inoculability on animals.

In 1890 I saw such lesions at Schwenninger's clinic while he and Buzzi were experimenting in the early days of Koch's tuberculin. At the same time I also witnessed the so-called local and general reaction take place in established cases of lichen scrofulosus, also in some cases of lupus erythematosus. Unfortunately with the disappointment at that time to find a "sure cure" in Koch's great invention for all cases of phthisis, gathered at Berlin in midwinter, these experiments were not pushed and were forgotten. In contradistinction, Mracek[11] holds the tuberculides to be bacillary tuberculoses of hematogenic origin and fortifies this contention by the demonstrations of bacilli and positive inoculation results cited before—that the tuberculides as well as the classical tuberculous affections of the skin are both of hematogenic origin, with the exception of the inoculated forms *per extra,* is an attribute common to both. Neither does the inability to demonstrate the tubercle bacilli in the tuberculides vitiate against their being of tuberculous origin. Furthermore, we know how difficult of demonstration they are even in true tuberculosis and how rarely we succeed in inoculating experiments. From all these conditions common to both forms one can perceive that the class heading of tuberculide or tuberculosis of the skin is an arbitrary one. Among these tuberculides, erythema induratum Bazin stands in its relation to tuberculosis about third on the list, being preceded by lichen and acne scrofulosus and the papulonecrotic tubercle. In about more than half of the reported cases it was proven associated with tuberculosis. In extremely rare instances the bacilli were found

11. Handb. d. Hautkr., Wien., 1906, iv, p. 266.

in the lesions, especially by Wollf. In other instances inoculation on guinea-pigs proved positive (Thibierge and Ravout,[8] C. Fox,[12] Carlé[9] and Jadassohn[13]), while in other cases the tuberculin test in the patient proved positive (Mracek,[11] Mantegazza,[14] Hartung and Alexander,[15] Söllner[16] and myself). Histologic and bacteriologic examination also show different opinions. Audry[17] regards it as non-tuberculous; Leredde,[18] Thibierge and Ravout[19] hold it to be of tuberculous origin. The latter demonstrated the main changes in the vessels: endothelial proliferation almost to the point of occlusion; giant cells with peripheral nuclei and numerous epithelioid cells.

One of the most constant findings is the atrophy of the subcutaneous fat tissue into large cysts and transformation into connective tissue. The clinical picture of erythema induratum is well charactreized. Bazin[20] describes it as occurring in red hard nodes, paling at compression, tough or doughy to the touch and extending into the subcutaneous tissue. The formations do not itch and are only slightly tender on pressure. The affection is localized with predilection on the legs; anteriorly, on the calves and laterally. It is more frequent in girls than in boys. Neither Bazin or Besnier[21] nor recently Jarisch[22] alludes to any changes taking place in these nodes. They describe them as undergoing absorption.

Conditions became somewhat confused when Hallo-

12. Brit. Jour. Derm., August, 1893, p. 225.
13. Correspbl. f. Schweiz. Aerzt., 1899, p. 626.
14. Annal. Derm. and Syph., 1901, No. 6.
15. Arch. Derm., and Syph., 1902, lx; Med. Centrtg., 1904, lii; Arch. Derm. and Syph., 1904, lxxi, Nos. 2 and 3.
16. Monatsh. pract. Derm., 1903, xxxvii, p. 545.
17. Annal. Derm. and Syph., 1898, p. 209.
18. Ibid., 1898, p. 893.
19. Ibid., x, p. 513.
20. "Leçons sur la Scrofula," 1861, p. 146, and his other "Leçons," 1862 and 1868.
21. Annal. Derm. and Syph., 1889, p. 25.
22. Die Hautkr., Wien Hölder, 1900, p. 115.

peau and Leredde,[23] Hutchinson,[24] C. Fox,[12] White[25] and others reported ulcerating cases which greatly resembled scrofuloderma ulcerosum. Doubtless many cases of the latter have been taken as erythema induratum and *vice versa.* A non-ulcerating subcutaneous scrofuloderma occurring in young people and occupying the lower extremities is, indeed, apt to be confounded with the node of erythema induratum. I venture the opinion that these formations are so closely allied to each other that neither clinical nor histologic or bacteriologic differences can hold them apart without diagnostic artifices. Even the ulcerating form of erythema induratum has many similarities with ulcerating scrofuloderma, although I admit that the caseating undermined reactionless scrofulogummata with their extensive skin destruction will permit of some differentiation especially when it started from a lymph gland and much more so when on other parts than the lower extremities.

The localization of the lesions on the legs may be regarded as the classical feature of erythema induratum. Sluggish circulation, impaired *vis a tergo,* are the main causes of its appearance there and also of lupus pernio or simple pernio so frequently accompanying this trouble. While the disease almost exclusively affects females, yet in rare instances it has also been found in men, and, although it is most frequently met in adolescent girls and young women, yet of late it has been found in older women also. Johnston[26] found it in association of what is called to-day papulo-necrotic tubercle on the hands and forearms. He calls these affections paratuberculoses.

DIAGNOSIS.

The diagnosis of erythema induratum Bazin has in a great measure been alluded to previously, out of which the picture of the disease can be construed without marked difficulty. These are the salient points: forma-

23. "Dermatologie," Paris, 1900.
24. Smaller Atlas, 1896.
25. Jour. Cut. and Gen. Urin. Dis., 1894.
26. Ibid., July, 1899, p. 311.

tion of subcutaneous deep-seated nodules, more easily recognizable by touch than by sight. They develop into hard deep-seated indurated nodes, not adherent to the skin at first, but becoming so later. The skin is at first purplish, then as the nodes become larger and work toward the surface it changes into a dull violaceous hue. In size they occur from that of a cherry or even double its size. They also occur on both sides of the achilles tendon. Their cause is eminently chronic, their development and behavior tardy and of slow activity. In those rare instances when they break down necrosis sets in on the summit of the node in one, rarely in several places, attended by a scanty seropurulent discharge. The final scaring and pigmentation is then not so pronounced as that of an ulcerous scrofuloderma.

ETIOLOGY.

As regards their etiology, the association of erythema induratum in half of the cases with the tuberculous taint, its occurrence chiefly in women sometimes also affected with circulatory disturbances, has been alluded to. In more than 50 per cent. of cases the tuberculin test proved positive. To reconcile this etiologic discrepancy, Whitfield[27] in 1900 and again in 1905 asserted, that there exist two well characterized types of the affection: a tuberculous and a non-tuberculous. The former, attacking young women, is of an indolent character and presumably due to the living tubercle bacilli; the latter, occurring in middle-aged women affected with circulatory disturbances, is of a rheumatic nature, more painful, prone to break down and not allied to tuberculosis.

CASE REPORT.

The following is the history of my case:

History.—Mrs. M. M., aged 26, Russian, married, has no children, no history of lues, but has mitral trouble. A nephew has a tuberculous taint.

27. Am. Jour. of the Med. Sc., December, 1900, and September, 1901. Also Brit. Jour. Dermat., July, 1905.

Nine years ago, in *winter* of 1896, she noticed a lump on the inner aspect of the left lower leg. She was given a salve, which, in the language of the patient, took out the inflammation. The lump eventually disappeared. In the meantime, however, several others appeared, one on almost the same spot, and another on the right leg. All of them disappeared in May, 1897. In the winter of 1897 lumps appeared again in about the same region, but not in the same situation. They disappeared in the summer of 1898. For five years no recurrence took place, when in November of 1904 lumps again appeared to the right and left of the Achilles tendon of the left leg and on the calf of the right. Patient could hardly walk and had to stay at home for a week. All lesions disappeared in May, 1905.

In November, 1905, patient alleges she left the house well, and in walking she noticed a "rushing, painful sensation" in her right leg, and when she reached home she noticed the appearance of the lumps(?) She particularly states, that she had always had pains in her legs before the appearance of the lumps. This time they appeared on the outer aspect of the right leg, others spreading over the front and back of the thigh, over the nates, and a few over the back and over both arms. Only slight tenderness on pressure.

Examination.—On examination I counted thirteen on the right and ten on the left leg, appearing as subcutaneous consistent tumors from the size of a split pea to that of half a walnut, and situated in the direction of the long axis of the body. As those on the lower legs developed, they worked themselves toward the surface and became purplish, without, however, any one of them breaking down. Those formations which were situated on the thighs and nates were invisible and could only be determined by careful palpation as deep, shot-like, hard bodies distributed in the subcutis. They were very painful, annoying her while sitting, but did not develop further. While under observation for over five months my associates and I noticed the spontaneous disappearance of the undeveloped ones first and of the others later.

A week's treatment with iodid of potash and salicylate of soda had no influence on them whatever, and as they had disappeared previously without any medication, nothing more was done. At the time of this report, May, 1906, there is no vestige of the affection left.

A review of this case of erythema induratum Bazin will show it to be a classical, as well as an extended ex-

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ample of the affection. Two etiologic factors are present, each of which plays a rôle as a pathogenetic factor. A young woman of otherwise healthy appearance with a congenital mitral affection, showing a slight stagnation hyperemia on both cheeks so frequent with heart affection, exhibits a sluggish chronic disease of *perennial* appearance and of the described qualities and peculiarities. The presence of a scaling lupus pernio (possessing almost the character of a lupus erythematosus) on four toes of the left and three of the right foot, extending over the metatarsal joints, is another important concomitant symptom so frequently mentioned by investigators. The *second* etiologic symptom is the positive result following the tuberculin injection. The patient had a stormy reaction; 24 hours later there was a temperature of 103 and a great deal of general disturbance. Inoculation on guinea-pigs taken from one of the excised formations proved negative.

The onset of the affection with pains, reported by Thibierge and Ravout, and Hartung[28] was present in a very marked degree. As to localization, I think this case showed a distribution of the lesions hitherto unobserved in the same patient. The occurrence of deep nodules *ad nates* has, to my knowledge, not yet been described. Close observation showed that they did not develop further and that none of the lesions broke down. The nearest approach to such a condition was a slightly doughy condition in the centers of the fully developed lesions. It is furthermore noteworthy that the formations would make their appearance in winter, then disappear and others reappear, the course of the whole process taking from four to five months ending with the approach of summer.

In this respect my case resembles that of Burns,[29] as regards the unusual number and distribution which suggested erythema nodosum, except for the long period

28. Arch. Derm. et Syph. lxxi, p. 385.
29. General Cut. Dis. incl. Syph., April, 1905, p. 177.

it lasted, which is incompatible with the latter. The two cases of W. Pick[30] which he calls persistent erythema nodosum, occurring in two young women with no evidences of tuberculosis, have very much in common with both forms of erythema. There are undoubtedly transition stages between the different tuberculides. Acne cachecticorum seems to be a higher development of lichen scrofulosus. Certain cases of erythema nodosum, especially those which are coexistent with the lesion of erythema exudativum multiforme, cause visceral lesions so classically described by Osler; or in turn may be the effect of such systemic infectious diseases. In tuberculous meningitis this is frequently the cause and leads one naturally to consider the assertion of Uffelman,[31] Bäumler[32] and others who believe in the association of a pernicious form of erythema nodosum with tuberculosis, the patients mostly having been descendants of tuberculous parents. It may be that erythema nodosum and erythema induratum are only different stages of the same process, with a slightly varying etiology and pathology. There is another evidence of the admissibility of such hypothesis by the occurrence of one or more of these tuberculides on one person. These tuberculides or paratuberculoses as Johnston calls them, have transition stages. Lichen scrofulosus has been seen with erythema induratum, with the papulonecrotic tubercle or necrotic granuloma of Johnston,[26] with follicilis or cutaneous tubercle described by Macleod and Ormsby,[33] etc. It is probably better not to adhere too slavishly to disease headings, which sometimes are only the result of arbitrary divisions.

The histologic features of my case are in harmony with the description of other investigators, but with slight deviations. An atrophic degeneration of the subcutaneous fat tissue, and formation of giant cells with

30. Arch. Derm. and Syph., lxxii, 1904, p. 360.
31. Deutsch. Arch. f. klin. Med., 1872, p. 76.
32. Deutsch. med. Wochschr., 1889.
33. Brit. Jour. Derm., 1901, p. 367.

radiating nuclei and epithelioid cells and endothelial proliferation of the vessels were present. These changes in the subcutaneous fat tissue are only characteristic of tuberculosis when other concomitant symptoms bear them out. In my case the vessel changes were not so prominent as to produce thrombosis and, in a sense, this would vitiate against the theory of a hematogenic origin. But their absence could be explained by the fact that the very smallest capillaries might have been already destroyed by the fatty degeneration of the embolic plugs.

DIFFERENTIAL DIAGNOSIS.

The transition forms of erythema nodosum have been alluded to. In a general way erythema nodosum can easily be differentiated from erythema induratum by the acute character and intensive systemic disturbances. Its lesions are more superficial, more painful and appear more suddenly, are of brighter color and more inflammatory in their character. They rarely, if ever, break down and their absorption takes place in a manner resembling the color changes of a fading contusion. Hence the name contusiveform dermatitis. Again, erythema induratum has a chronic course, as a rule does not, but may break down in a small number of cases, is not connected with the stormy systemic disturbances and yields a more evanescing pigmentation.

In differentiation from syphilitic gummata, which it resembles strikingly, I may mention, that gummata will never appear so numerously, neither will their appearance be attended by systemic disturbances. Again, a gumma will not exist for months without changing. If absorbed, it will do so by local or general mercurial treatment. The confusion with lepra, to which it bears a far-away resemblance, it not very imminent.

As the question of the tuberculides is as yet in a very undecided condition, and the etiology and pathology of

erythema induratum is not quite settled, the reporting of every case is a duty incumbent on the observer.

In conclusion, I regard it my pleasant duty to express my gratitude to Prof. Harlow Brooks, M.D., of the Department of Pathology, University and Bellevue Medical College, New York City, for his painstaking pathologic and bacteriologic examination of this case.

DISCUSSION.

DR. A. RAVOGLI, Cincinnati, said that he has always been firmly convinced that erythema induratum is an expression of tuberculosis. In support of this he mentioned the case of a man who accidentally injured his finger, a splinter entering underneath the nail. This splinter carried with it the infection from the saliva of a tuberculous patient, and subsequently an ulcer developed at that point, which proved very persistent. This was followed, in the course of time, by little reddish points in the line of the lymphatics of the arm. These were hard and indicated an erythema induratum. They gradually developed into ulcers and proved to be tuberculous, and doubtless resulted from the original inoculation under the nail. The lesions were thoroughly cauterized, and the patient eventually made a perfect recovery. Another case reported by Dr. Ravogli was that of a young woman who had a number of lesions on the calf of the leg. These persisted for some time without causing any trouble. Some of them disappeared entirely, but one of them ulcerated and had the appearance of a tuberculous lesion. This patient finally died of tuberculosis. He said that since then he has become thoroughly convinced that erythema induratum is a true expression of tuberculosis. Dr. Ravogli said that the cases he has seen of erythema nodosum have led him to believe that it has no connection with tuberculosis. The lesions in erythema nodosum are only of a transient character and without serious consequences.

DR. M. L. HEIDINGSFELD, Cincinnati, said that in spite of the experience of Dr. Ravogli, he still regards tuberculin as a perfectly safe drug to use, and he has never seen any deleterious effects from it. He has found the American products unreliable, he said, and he recalled cases in which their injection had failed to produce any reaction, although tuberculosis was unquestionably present. In using tuberculin, the physician should not only be assured that his preparation is reliable, but that it has not deteriorated. Dr. Heidingsfeld said that the value of tuberculin as a diagnostic factor is demonstrated by the case which Dr. Ravogli cited as an instance of erythema induratum (Bazin). Dr. Heidingsfeld saw that patient at a later stage, and was convinced that the case was one of syphilis; after four weeks of internal treatment with mercury and

potassium iodid, and mercurial ointment externally, the lesions cleared up entirely. If tuberculin had been used early in that case the true character of the lesions would doubtless have been recognized. In a case of syphilis which he saw last autumn there was a double infection, with one chancre on the lip and another on the vulva. The case ran a rather severe course in spite of energetic treatment, and large indurated masses developed on the leg and other parts of the lower extremities. These were first regarded as gummatous in character, but mixed treatment had no effect on them, and they subsequently proved to be tuberculous. In that case an injection of tuberculin produced a decided reaction and helped to establish the diagnosis.

DR. JAMES C. WHITE, Boston, said that he believed he was the first to describe this affection as occurring in this country. He observed a type of chronic deep, nodular induration, the lesions being of considerable size. They occurred on the lower extremities and did not run the course of those seen in erythema nodosum. On examining the literature to find a record of such instances elsewhere, he came to Bazin's description of this affection, to which they bore a close resemblance. As time has gone on he has seen cases which were apparently connective links between the typical lesions of erythema induratum, and other conditions of the skin of probably tuberculous nature. At first it was thought that the lesions were confined chiefly to the lateral and posterior surfaces of the lower extremities, but it is now admitted that similar lesions are found more widely distributed over the body; they are sometimes of smaller size and are not confined exclusively to the lateral and posterior surfaces. It is natural, Dr. White said, to associate these conditions with the so-called tuberculides, which have more recently been described.

DR. LUDWIG WEISS, New York City, said that in a recent search of the literature he found a case closely resembling that mentioned by Dr. Ravogli, which Jaddasohn has reported under the name of tuberculosis multiplex subcutanea. The lesions in that case developed within a few weeks and then broke down, leaving fistulous openings. The description did not perfectly tally with that of erythema induratum. Dr. Weiss does not believe that in the classical erythema induratum of Bazin the lesions are apt to break down; the same is true of erythema nodosum, and he thinks that the cases recorded as having broken down lesions did not all belong to this type. Dr. Weiss said that it is over 10 years since Dr. White's article first appeared in the *Journal of Cutaneous and Genitourinary Diseases*. In that article Dr. White had a premonition of the discrimination that should be made between different tuberculous lesions of the skin, and warned the dermatologist not to cling too slavishly to any particular de-

tail of the class of lesions now known as tuberculides. In this class of diseases Dr. Weiss regards tuberculin as a valuable diagnostic factor, although he recalled one instance of dormant tuberculosis in which the disease was aroused to activity by an injection of tuberculin, and rapidly caused a fatal tuberculosis of the larynx. With the minute doses used at present such an accident is not likely to occur.

OFFICIAL MINUTES.

TUESDAY, JUNE 5—AFTERNOON.

Dr. Abner Post, Boston, announced that the chairman of the Section, Dr. Douglas W. Montgomery, San Francisco, would be unable to be present on account of the recent earthquake and conflagration in his city. He also announced that the secretary, Dr. R. R. Campbell, Chicago, would be unable to be present.

It was thereon moved and carried that Dr. Ludwig Weiss, New York City, be appointed temporary chairman. Dr. M. L. Heidingsfeld, Cincinnati, was appointed temporary secretary.

A paper prepared by Drs. William Frick and Frank J. Hall, Kansas City, Mo., on "Generalized Multiple Pigmented Sarcoma Originating in the Skin" was read by Dr. Hall and discussed by Drs. David Lieberthal, Chicago; A. Ravogli, Cincinnati; Alexander J. Anderson, Newport, R. I.; B. W. Stearns, Binghamton, N. Y., and Dr. Hall.

Dr. A. Ravogli, Cincinnati, read a paper on "Consequence of Lupus Vulgaris of the Ear." Discussed by Drs. M. L. Heidingsfeld and A. Ravogli, Cincinnati.

Dr. Ludwig Weiss, New York City read a paper on "Erythema Indurata (Bazin)" which was discussed by Drs. A. Ravogli and M. L. Heidingsfeld, Cincinnati; James C. White, Boston, and Dr. Weiss.

Dr. James C. White, Boston, announced that at a meeting of the American Dermatological Association, held in Cleveland, Ohio, last week, he was requested to present to the Section on Cutaneous Medicine and Surgery of the American Medical Association some information in regard to the progress which was being made by the Organization Committee in preparing for the next International Dermatological Congress, to be held in New York City in September, 1907. At the last meeting of the congress, held in Berlin, an invitation was presented to the congress on behalf of the Section on Cutaneous Medicine and Surgery of the American Medical Association by Dr. Henry W. Stelwagon, and another on behalf of the American Dermatological Association, to meet in this country, and that invitation had been accepted. An Organization committee was

selected by the officers chosen at the Berlin meeting, which was composed of 25 men from different parts of the country. That committee had been steadily at work and subcommittees had been appointed. The Committee on Finance had already raised nearly $12,000 for the expense of the meeting, this money having been subscribed almost exclusively by dermatologists in this country. Efforts were being made to increase this fund to at least $20,000. Three themes had been selected for general discussion at the meeting: "The Etiologic Relationship of the Microörganisms Found in the Exanthemata," "The Tropical Dermatoses," "The Immunization and Parasitology of Syphilis." Many prominent specialists, both from this country and abroad, are expected to take part in these discussions. Dr. White said that in September, 1906, a general prospectus of the meeting will be mailed to dermatologists in this country and abroad, inviting them to attend the meeting and to present papers. It will be specified, however, that the committee reserves the right to reject such communications as they see fit. This will be done to obviate the fault that has been found with past meetings of the congress, where so many papers have been presented that they failed to receive proper consideration. In June, 1907, a full program of the meeting will be sent to those interested in this field of medicine, which would contain all the details.

The chairman, Dr. Weiss, conveyed the thanks of the Section to Dr. White for his interesting communication.

The following nominating committee was appointed by the chairman: Drs. David Lieberthal and W. L. Baum, Chicago, and Albert E. Carrier, Detroit.

Wednesday, June 6—Afternoon.

The secretary, Dr. Heidingsfeld, read a communication from Dr. Kaspar Pischel, San Francisco, announcing the death of Dr. F. R. Day, in Honolulu, Hawaii, June 1, 1906. Dr. Day's name was on the program of the Section for an exhibition of wax models in cases of leprosy, which Dr. Pischel said were really works of art, as he could testify from personal observation while in Honolulu. Dr. Day was among the foremost physicians in Honolulu, and as a physician, citizen and man he was highly esteemed by the whole community.

Dr. William M. Davis, Denver, expressed the regret of the Section on the death of Dr. Day, and moved that the secretary be instructed to convey to the relatives of the deceased the sincere condolence of the Section on Cutaneous Medicine and Surgery on their heavy loss.

Dr. Henry G. Piffard announced the recent death, in Gibraltar, of Dr. Charles W. Allen, New York City, who had been an active member of the Section.

Dr. William S. Gottheil, New York City, expressed the regrets of the Section on the death of Dr. Allen, and moved that the secretary be instructed to convey to the daughters of the deceased, who were his sole survivors, the sincere condolence of the Section on Cutaneous Medicine and Surgery on their heavy loss.

A paper on "The Therapeutic Value of Chrysophanic Acid in Dermatology," was read by Dr. Charles James Fox, Hartford, Conn. Discussed by Drs. Henry G. Piffard and William S. Gottheil, New York City; James C. White, Boston; R. A. McDonnell, New Haven, Conn.; Edmund L. Cocks, New York City; Henry C. Baum, Syracuse, N. Y.; Ludwig Weiss, New York City.

A paper on "Lichen Planus of the Mouth and Lips, with Report of Case," was read by Dr. David Lieberthal, Chicago. Discussed by Drs. L. Duncan Bulkley, New York City; James C. White, Boston; Henry G. Piffard, New York City, and Dr. Lieberthal.

The chairman, Dr. Ludwig Weiss, gave a lantern slide exhibition bearing on his paper on "Erythema Induratum (Bazin)," which was read at the previous session of the Section.

Dr. M. L. Heidingsfeld, Cincinnati, O., read a paper on "Myomata Cutis, with Report of Two Cases (Demonstrated from Lantern Slides)."

A paper on "Aids to Accuracy and Efficiency in Radiotherapy," was read by Dr. Henry G. Piffard, New York City. Discussed by Drs. L. Duncan Bulkley, New York City; E. G. Williams, Richmond, Va.; J. C. Price, Scranton, Pa.; William S. Gottheil and L. Duncan Bulkley, New York; Mihran K. Kassabian, Philadelphia; John B. Kessler, Iowa City, Iowa; H. P. Wells, St. Louis; William S. Newcomet, Philadelphia; David Lieberthal, Chicago, and Dr. Piffard.

A paper on "Endothelioma of the Skin," by William S. Gottheil, New York City. Discussed by Drs. L. Duncan Bulkley, New York City; M. L. Heidingsfeld, Cincinnati; Edmund L. Cocks, New York, and William S. Gottheil.

THURSDAY, JUNE 7—AFTERNOON.

Dr. L. Duncan Bulkley, New York City, read a paper on "The Cure of Psoriasis; with a Study of 509 Cases Observed

in Private Practice." Discussed by Drs. Frederick A. Rhodes, Pittsburg, Pa.; C. P. Sylvester, Boston; William S. Gottheil, New York City; Francis J. Shepherd, Montreal; James C. White, Boston; W. D. Calvin, Fort Wayne, Ind.; Gardner T. Swarts, Providence, R. I.; John B. Kessler, Iowa City, Iowa; Henry W. Stelwagon, Philadelphia; F. A. Kleinhans, Milwaukee, Wis.; William L. Baum, Chicago; David Lieberthal, Chicago, and Dr. Bulkley.

The nominating committee reported as follows: Chairman, R. R. Campbell, Chicago; secretary, Henry R. Varney, Detroit; delegate, M. L. Heidingsfeld, Cincinnati; alternate, Ludwig Weiss, New York City.

Dr. Heidingsfeld requested that his name be withdrawn from the list of nominations.

Dr. L. Duncan Bulkley, New York, moved that the report of the nominating committee be received. Seconded and carried.

On motion of Dr. Bulkley, Dr. R. R. Campbell, Chicago, was elected chairman for the ensuing year.

Dr. Bulkley then moved that Dr. Heidingsfeld be nominated for secretary. Seconded.

Dr. Varney withdrew his name in favor of Dr. Heidingsfeld.

Dr. Heidingsfeld was thereon elected secretary for the ensuing year.

On motion of Dr. Bulkley, Dr. Henry R. Varney, Detroit, was elected member of the House of Delegates.

On motion of Dr. Lieberthal, Dr. Ludwig Weiss was elected alternate member of the House of Delegates.

Dr. Alembert W. Brayton, Indianapolis, read a paper on "A Note on the Erythemas Complicated with Internal Lesions."

A paper on "A Record of Some Unusual Cases," was read by Dr. William S. Gottheil, New York City.

Dr. Ernest L. McEwen, Chicago, read a paper on "The Relation of Nerve Impulse to Cutaneous Inflammation."

A paper on "A Case of Pemphigus Affecting the Mucous and Serous Membranes Only," was read by Dr. Edmund L. Cocks, New York City. Discussed by Drs. William S. Gottheil and L. Duncan Bulkley, New York City.

Dr. Henry W. Stelwagon exhibited a number of photographs of interesting skin diseases.

Before declaring the Section adjourned Dr. Weiss thanked the members for having honored him by electing him their temporary chairman, and for their prompt attendance and for the excellence of the papers presented.

LIST OF MEMBERS OF THE SECTION ON CUTANEOUS MEDICINE AND SURGERY.

List of present members of the American Medical Association who are making a specialty of cutaneous medicine and surgery. The numbers after the names indicate the record of attendance at annual sessions. (2 indicates, 1902; 3, 1903; etc. The Section did not meet in 1905.)

Alderson, M. E., Russellville, Ky. 6.
Allen, John Thomas, Brownsville, Tenn. 6.
Alexander, T. B., Scituate, Mass. 6.
Ankrim, L. F., Pittsburg. 6.
Anthony, H. G., 920 Stewart Bldg., Chicago. 2, 3, 4.
Aud, C. Z., Cecilian, Ky. 6.
Barstow, G. W., Three Bridges, N. J. 4.
Baum, Henry Clay, Syracuse, N. Y. 6.
Baum, Wm. L., 103 State St., Chicago. 2, 4, 6.
Biddle, A. P., 57 W. Fort St., Detroit. 6.
Biggs, E. L., Hot Springs, Ark. 6.
Blount, E. A., Jr., 422 Wilson Building, Dallas, Texas. 3.
Boggs, Russell H., Pittsburg. 6.
Booth, Bradford A., 6027 Penn Ave., Pittsburg. 4.
Bradford, G. D., Homer, N. Y. 2.
Bradley, Mark S., 224 N. Meridian St., Hartford, Conn. 6.
Brayton, A. W., 244 E. Ohio St., Indianapolis. 3, 4, 6.
Brennan, T. F., San Francisco. 6.
Breneman, P. P., Lancaster, Pa. 4.
Buehler, Geo. V., Boston. 6.
Bufford, John Henry, Boston. 6.
Bulkley, Lucuis D., 531 Madison Ave., New York, 2, 3, 4, 6.
Bull, T. M., Naugatuck, Conn. 4.
Burns, F. S., Boston. 6.
Butler, G. E., Fall River, Mass. 6.
Calvin, W. D., Fort Wayne. 6.
Cocks, E. L., 156 W. 119th St., New York, 2, 4, 6.
Campbell, R. R., 100 State St., Chicago, 2, 3, 4.
Carrier, Albert E., 423 Stevens Bldg., Detroit. 4, 6.
Carmon, J. H., Plainfield, N. J., 4.
Clack, J. Morgan, Rockwood, Tenn. 6.
Collings, H. P., Hot Springs, Ark. 4.
Collings, S. P., Hot Springs, Ark. 4.
Cook, John W., Pendleton, Ind. 6.
Corlett, Wm. T., 1935 Euclid Ave., Cleveland. 2, 4.
Cornwell, Herbert C. de V., New York. 6.
Davis, William H., Denver. 6.
Dickson, J. A., Ashtabula, Ohio. 6.
Dix, George A., Worcester, Mass. 6.
Doughty, James W., F. P. Hospital, Tacoma, Wash. 6.
Duncan, John H. (Marion-Sims Medical College), 501 Humboldt Bldg., St. Louis. 3.
Dyer, Isadore, 124 Baronne St., New Orleans. 3, 4.
Earle, Samuel T., Jr., Baltimore. 6.
Elliott, Thomas, Sharon, Pa. 4.
Everett, Oliver H., Worcester, 4.
Ewing, W. B., 200 9th St., Pittsburg. 4.
Firman, F. W., Findlay, Ohio. 2.
Fenyes, Adalbert, Pasadena, Cal. 6.
Fewsmith, Joseph, Newark, N. J. 6.
Finck, Edward Beecher, Philadelphia. 6.
Fletcher, C. L., Win's Station, N. Y. 4.
Flynn, John L., Cambridge. 6.
Foerster, O. H., Milwaukee. 6.
Fordyce, J. A., 80 W. 40th St., New York City. 3, 4.
Foster, Barzillai B., Portland, Me. 6.
Foster, Burnside, Lowery Arcade Block, St. Paul. 4, 6.
Foster, Horace K., Peabody, Mass. 6.
Friedrichs, E. D., New Orleans. 3.
Frick, Wm., 301 Rialto Bldg., Kansas City, Mo. 4.

Fox, Charles James, Hartford, Conn. 6.
Fuller, Frederick H., Walpole, Mass. 6.
Frank, Louis P., Milwaukee, Wis. 6.
Geist, J. W., Wilkes-Barre, Pa. 4.
Gibson, J. M., McIndo Falls, Vt., 6.
Gilchrist, Thomas Caspar, 330 N. Charles St., Baltimore. 4.
Gnichtel, A. L., New York. 6.
Gottheil, W. S., 144 W. 48th St., New York. 2, 4, 6.
Gold, J. D., Bridgeport, Conn. 4.
Guild, T. E., Boston. 6.
Halberstadt, A. H., Pottsville, Pa. 6.
Hamlin, O. D., Oakland, Cal. 4.
Hartung, H. H., Boston. 6.
Hartzell, Milton B., 3634 Chestnut St., Philadelphia. 2.
Hay, E. C., Hot Springs, Ark. 4.
Haynes, Mabel S., Boston. 6.
Heidingsfeld, M. L., Vintonissa Bldg., Cincinnati. 2, 3, 4, 6.
Henderson, R. G., Memphis. 3.
Hixon, Edwin C., Boston. 6.
Holland, Hubert T., Boston. 6.
Hoffman, J. Y., Reading, Pa. 4.
Hopkins, Ralph, 730 Esplanade St., New Orleans. 3, 4.
Vander-Horck, Max P., Minneapolis. 3.
Howe, James Sullivan, Boston. 6.
Huelburt, S. R., 626 Dearborn St., Chicago. 4.
Hutchins, Miller Bone, 1007 Century Bldg., Atlanta. 4.
Hyde, James N., 100 State St., Chicago.
Jepson, S. L., Wheeling, W. Va. 6.
Jones, S. W., Franklin, N. H. 6.
Judkins, F. L., Lynn, Mass. 6.
Kassabian, Mihran K., Philadelphia. 6.
Keaney, Henry J., Everett, Mass. 6.
Kessler, J. B., Iowa City, Iowa. 3, 4, 6.
Killoe, P. H., Springfield, Mass. 6.
Kimball, Harry Waldo, Providence. 6.
Knight, Marcus W., Milford, Mass. 6.
Kivlin, Charles F., Troy, N. Y. 6.
Langfitt, W. J., Allegheny, Pa. 4, 6.
Lieberthal, David, 1750 Wrightwood Ave., Chicago. 2, 4, 6.
Linville, M., Newcastle, Pa. 4.
Lothrop, Howard A., Boston. 6.
Loud, J. W., 1011 N. Charles St., Baltimore.
Luce, Thomas W., Portsmouth, N. H.
MacKillap, Daniel, Cambridge, Mass. 6.
Marquardt, Chris. H., La Crosse, Wis. 6.
McDonnell, Ralph A., New Haven, Conn. 6.
McEwen, Ernest L., 1745 Orrington Ave., Evanston, Ill. 6.
McGehu, E. P., Lake Village, Ark. 4.
McNeil, E. K., Jackson, Tenn. 3.
Meek, Edith R., Boston. 6.
Menage, H. E., New Orleans. 3, 6.
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